EVOLUTION SC

INK JET PRINTERS
INSTALLATION AND OPERATION MANUAL

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This manual is for use in operating and maintaining the EVOLUTION SC Ink Jet Printer. For basic start-up instructions, please refer to PART 1 Installation Procedures.

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ALL PRINT CARTRIDGES SUPPLIED BY DIGITAL DESIGN INC. ARE FACTORY TESTED AND USE INKS SPECIALLY FORMULATED TO PRODUCE AN OPTIMUM AND CONSISTANT CODE. USING OTHER THAN AUTHORIZED CARTRIDGES MAY CAUSE UNDESIRABLE RESULTS.
EVOLUTION SC IS A FULL FEATURED MODEL WITH VARIABLE FIELD PROGRAMMING CAPABILITIES.

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MSDS FOR EVOLUTION SC INKJET CARTRIDGES

4052 BLACK (RED GREEN BLUE) - FOR POROUS SURFACES

This ink is made expressly for use with Evolution Inkjet printers manufactured by DIGITAL DESIGN INC. For best results, please follow the instructions contained in the manual provided with the printer.

HEALTH	**1**
FLAMMABILITY	**1**
REACTIVITY	**0**
PERSONAL PROTECTION	**B**

Reorder Part No. 4052BK or 4052RD or 4052GR or 4052BL
Manufactured by:
DIGITAL DESIGN INC
67 Sand Park Road
Cedar Grove, NJ 07009

RISK PHRASE(S)

Large doses irritating to eyes and respiratory system. Ingestion may cause acute gastro-intestinal upset.

PRECAUTIONARY MEASURES

Wear safety glasses. Use solvent-resistant gloves and vapor respirator for spills, leaks or other high exposures.

FIRST AID MEASURES

INHALATION:

REMOVE TO FRESH AIR.

EYE CONTACT:

CONTACT WITH THE EYES MAY CAUSE MILD IRRITATION. IMMEDIATELY FLUSH WITH LARGE AMOUNTS OF CLEAN, LUKEWARM WATER (LOW PRESSURE) FOR AT LEAST 15 MINUTES. SEEK MEDICAL ATTENTION IF EYE IRRITATION PERSISTS.

SKIN CONTACT:

WASH AFFECTED AREAS THOROUGHLY WITH SOAP AND WATER. CLOTHING SHOULD BE LAUNDERED BEFORE REUSE. SEEK MEDICAL ATTENTION IF SKIN IRRITATION PERSISTS.

INGESTION:

INGESTION OF INK MAY CAUSE STOMACH UPSET. SEEK MEDICAL ADVICE. SEEK MEDICAL ATTENTION IF STOMACH UPSET PERSISTS (THIS INK CONTAINS ETHYLENE GLYCOL).

Guarantee Exclusion and Limitation of Liability: For a period of one year from the date of manufacture, DIGITAL DESIGN INC. (“Seller”) warrants that the ink shipped shall conform to Seller’s specifications. EXCEPT FOR THIS WARRANTY, SELLER MAKES NO WARRANTY OF ANY KIND, INCLUDING THE WARRANTY OF MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE. On any claim accepted by the Seller, SELLER’S LIABILITY SHALL NOT EXCEED ITS OBLIGATION TO REPLACE THE ALLEGEDLY DEFECTIVE INK, OR TO RETURN THE PURCHASE PRICE PAID BY THE PURCHASER FOR ALLEGEDLY DEFECTIVE INK. IN NO EVENT SHALL SELLER BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL OR SPECIFIC DAMAGES, WHETHER IN TORT OR CONTRACT OR ANY THEORY OF LAW.

MSDS FOR EVOLUTION SC INKJET CARTRIDGES

4053 BLACK - FOR SEMI/NON POROUS SURFACES

This ink is made expressly for use with Evolution Inkjet printers manufactured by DIGITAL DESIGN INC. For best results, please follow the instructions contained in the manual provided with the printer.

HEALTH	**1**
FLAMMABILITY	**1**
REACTIVITY	**0**
PERSONAL PROTECTION	**B**

Reorder Part No. 4052BK or 4052RD or 4052GR or 4052BL
Manufactured by:
DIGITAL DESIGN INC
67 Sand Park Road
Cedar Grove, NJ 07009

RISK PHRASE(S)

Large doses irritating to eyes and respiratory system. Ingestion may cause acute gastro-intestinal upset.

PRECAUTIONARY MEASURES

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FIRST AID MEASURES

INHALATION:

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EYE CONTACT:

CONTACT WITH THE EYES MAY CAUSE MILD IRRITATION. IMMEDIATELY FLUSH WITH LARGE AMOUNTS OF CLEAN, LUKEWARM WATER (LOW PRESSURE) FOR AT LEAST 15 MINUTES. SEEK MEDICAL ATTENTION IF EYE IRRITATION PERSISTS.

SKIN CONTACT:

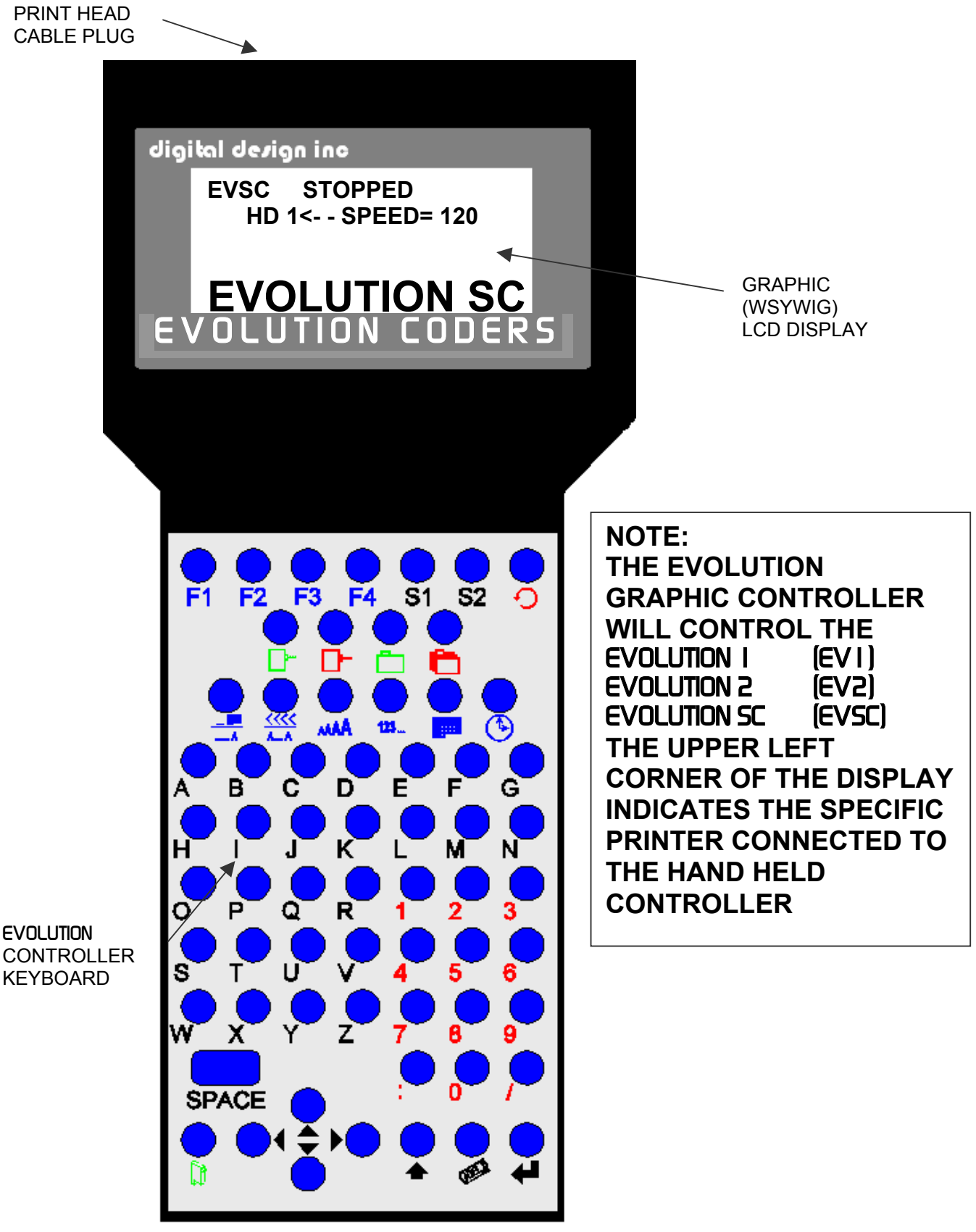
WASH AFFECTED AREAS THOROUGHLY WITH SOAP AND WATER. CLOTHING SHOULD BE LAUNDERED BEFORE REUSE. SEEK MEDICAL ATTENTION IF SKIN IRRITATION PERSISTS.

INGESTION:

INGESTION OF INK MAY CAUSE STOMACH UPSET. SEEK MEDICAL ADVICE. SEEK MEDICAL ATTENTION IF STOMACH UPSET PERSISTS (THIS INK CONTAINS ETHYLENE GLYCOL).

Guarantee Exclusion and Limitation of Liability: For a period of one year from the date of manufacture, DIGITAL DESIGN INC. (“Seller”) warrants that the ink shipped shall conform to Seller’s specifications. EXCEPT FOR THIS WARRANTY, SELLER MAKES NO WARRANTY OF ANY KIND, INCLUDING THE WARRANTY OF MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE. On any claim accepted by the Seller, SELLER’S LIABILITY SHALL NOT EXCEED ITS OBLIGATION TO REPLACE THE ALLEGEDLY DEFECTIVE INK, OR TO RETURN THE PURCHASE PRICE PAID BY THE PURCHASER FOR ALLEGEDLY DEFECTIVE INK. IN NO EVENT SHALL SELLER BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL OR SPECIFIC DAMAGES, WHETHER IN TORT OR CONTRACT OR ANY THEORY OF LAW.

EVOLUTION CONTROLLER



NOTE:
THE EVOLUTION GRAPHIC CONTROLLER WILL CONTROL THE
EVOLUTION 1 (EV1)
EVOLUTION 2 (EV2)
EVOLUTION SC (EVSC)
THE UPPER LEFT CORNER OF THE DISPLAY INDICATES THE SPECIFIC PRINTER CONNECTED TO THE HAND HELD CONTROLLER

INSTALLATION AND OPERATION MANUAL

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AMENDMENT RECORD

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All Pages at First Issue 1.0	26 Jun 2006
All Pages at Second Issue 1.1	15 Nov 2006

PART 1: INSTALLATION PROCEDURES

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INSTALLING THE EVOLUTION SC PRINTING SYSTEM

Caution should be taken while installing the EVOLUTION SC printing system on your equipment. Digital Design Inc. has taken every precaution to ensure a safe and accurate instruction set to guide the installer through the installation process. Follow the operational guidelines in the installation procedures.

VERIFY THAT YOUR EQUIPMENT IS IN PROPER OPERATING CONDITION.

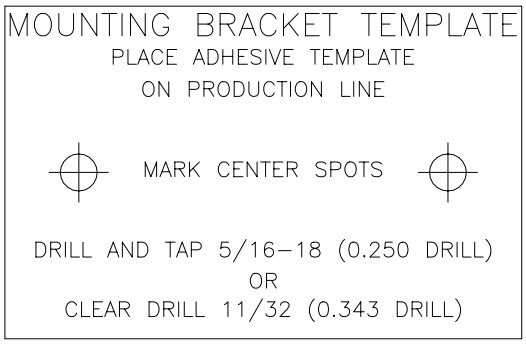
LOCATE A CONVENIENT POSITION ON YOUR EQUIPMENT. EVOLUTION SC REQUIRES 4-1/2" OF SPACE ON THE PRODUCTION LINE.

FOLLOW THE INSTALLATION PROCEDURES.

READ CAREFULLY ALL INSTALLATION PROCEDURES BEFORE PROCEEDING.

INSTALL THE PRINTING SYSTEM ON YOUR EQUIPMENT. THERE IS NO EXTRA HARDWARE REQUIRED OTHER THEN THAT SUPPLIED IN THE INSTALLATION KIT.

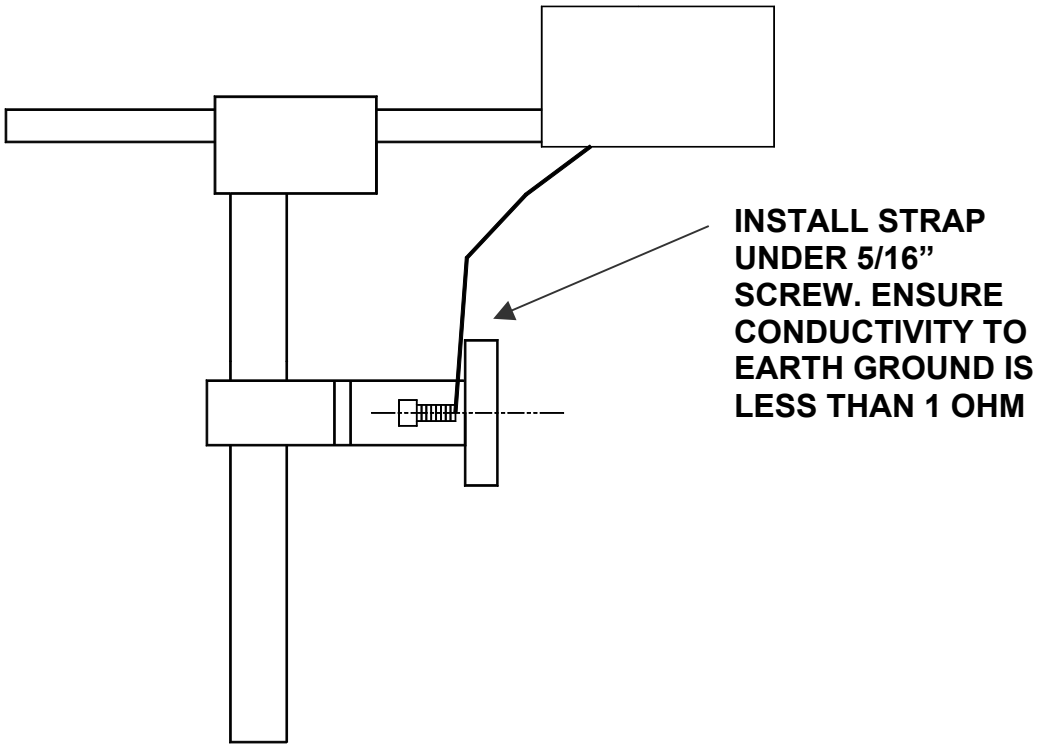
MOUNTING ON PRODUCTION LINE



Locate the supplied mounting template and affix in a convenient location on the production line. Spot and drill both mounting holes for a 5/16” bolt. NOTE: the user may also thread the side of the conveyer using a 5/16” tap.

Fasten the mounting bracket to the conveyer using the supplied mounting hardware and ensuring that the supplied ground strap is located securely beneath either of the two mounting bolts, and that conductivity to earth ground is less than 1 ohm. This ensures a proper path for static discharge, should the need arise.

GROUNDING STRAP INSTALLATION



INPUT POWER CONNECTION AND MODIFICATION

Insert the power plug to the available power source. The supplied power supply will is universal and will auto detect 100/240 VAC 50-60hZ.

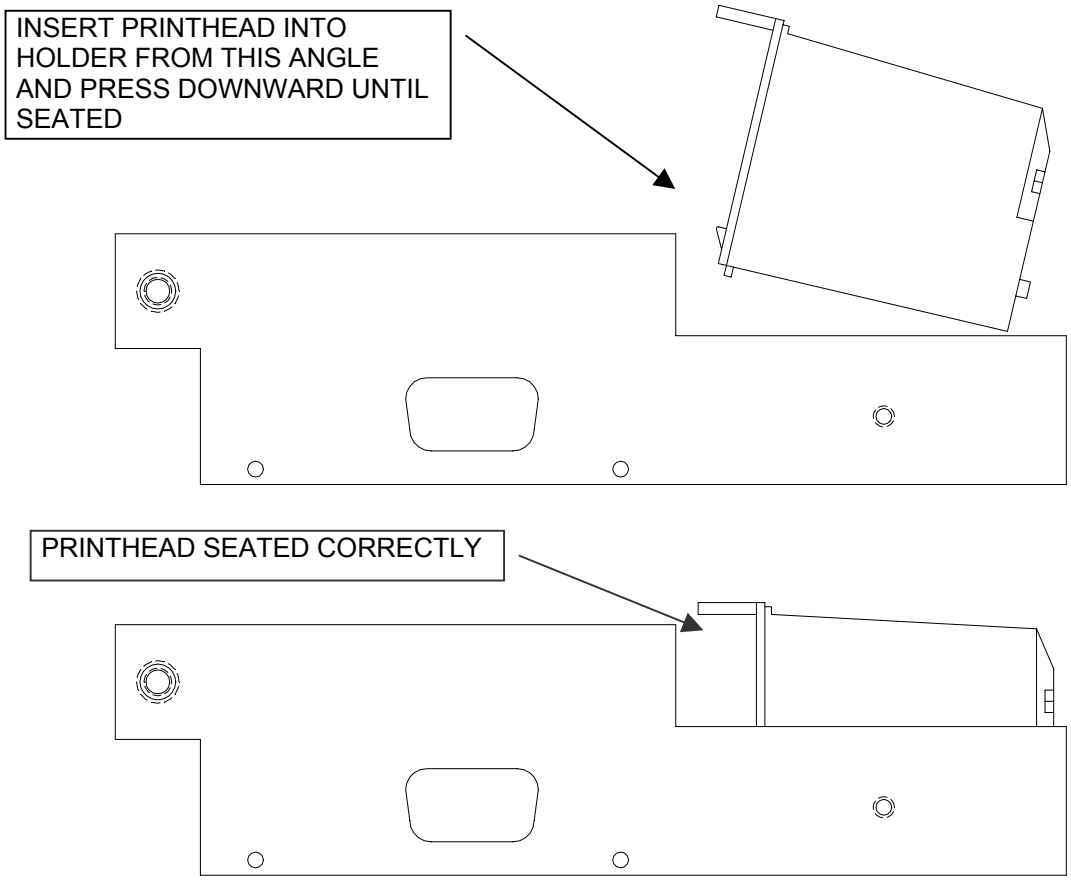
No other adjustments are necessary.

INSTALLING THE PRINT CARTRIDGE

Remove the protective film from the face of the print head and retain the film. This protective film may be re-applied to store partially used cartridges. If it is necessary to remove the print head and store for a long period of time, it is best to re-apply the plastic film, and place the cartridge in a closeable plastic bag.

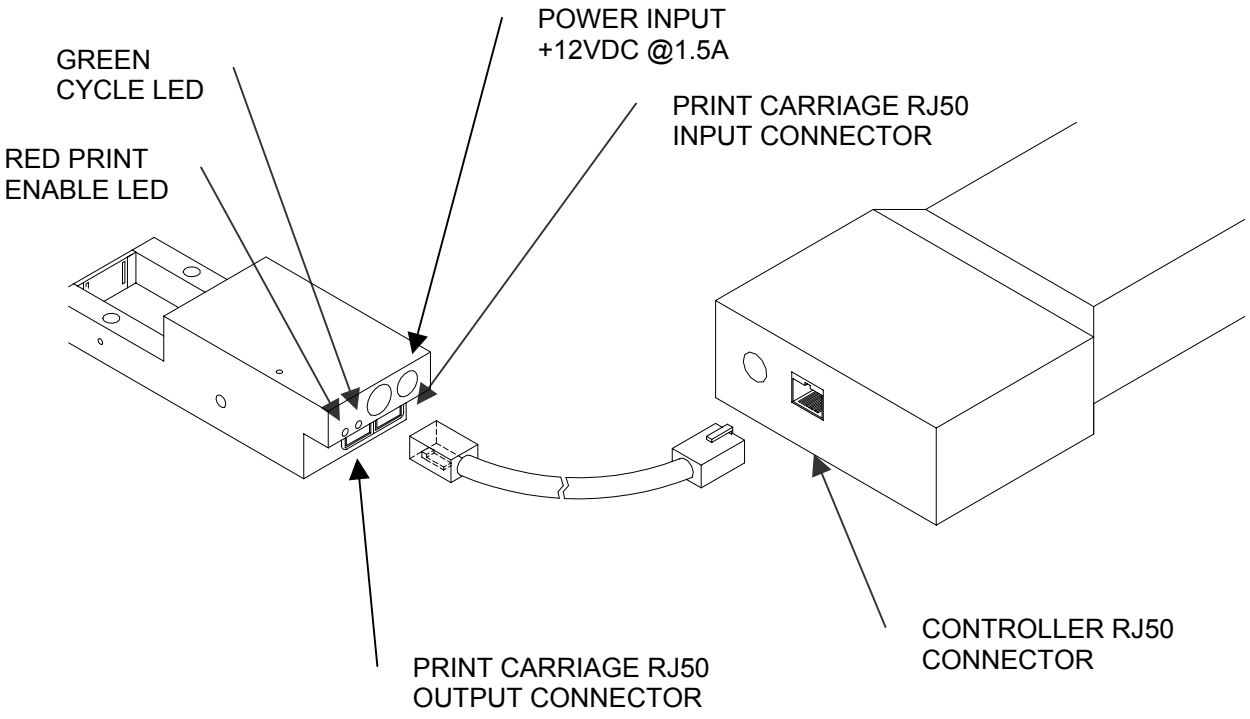
The print cartridge is installed into the print head by inserting at a slight angle and depressing the rear of the cartridge until it snaps into place. To remove the cartridge gently lift the rear tab on the

NOTE: EACH PRINT CARTRIDGE HAS BEEN TESTED AT THE FACTORY AND CONTAINS SPECIALLY FORMULATED INKS. USING ANY OTHER PRINT CARTRIDGE WILL HAVE UNDESIRABLE RESULTS.



CONNECTING THE CONTROLLER TO THE PRINT HEAD

Connect the Controller to the print carriage using the supplied 3 FT (.9 mm) interconnect cable C21008-3 supplied with the Printing System. The cable is a standard RJ50 (10 conductor). Longer cables are available as required.
Connect either end of the cable to the Carriage Assembly and securely lock in place. **NOTE: THE CONNECTOR MUST BE PLUGGED INTO THE INPUT RJ50 CONNECTOR LOCATED BELOW THE POWER CONNECTOR AND MARKED WITH AN ARROW POINTING TO THE CONNECTOR**. A click will be heard when the connector is in the appropriate position. Connect the free end to the Controller Assembly and ensure connector is securely seated.



CAUTION:
NOTE ORIENTATION OF THE CONNECTORS. DO NOT FORCE CONNECTORS INTO POSITION SECURELY LATCH (CLICK) INTO POSITION.
CONTROLLER MUST PLUG INTO THE PRINT CARRIAGE RJ50 INPUT CONNECTOR FOR PROPER OPERATION. THE PRINT CARRIAGE RJ50 OUTPUT CONNECTOR IS USED EITHER FOR CONNECTION TO THE NEXT PRINTER ON A NETWORK OR FOR EXTERNAL PRODUCT OR EXTERNAL ENCODER INPUT.
THE POWER INPUT CONNECTOR MUST BE SECURELY INSERTED INTO THE PRINT CARRIAGE. UPON PROPER INSERTION BOTH THE RED AND GREEN LED'S WILL FLASH INDICATING PROPER CONNECTION.

CONFIGURING THE PRINTER

To verify the current operating software press the STOP PRINT key.
Press the V key

```
CONTROLLER 1.02
EVSC     1.02 ++++
PRINTER SN XXXXXX
ANY KEY TO EXIT
```

The fist line indicates the version of the controller software
The second line is the software of the printer
The third line indicates the serial number of the printer

SYSTEM RESET

Soft Reset:

A Soft Reset may be performed by first removing the power from the system and while holding the R key depressed re-apply the power. Refer to the section on Soft Reset.

Hard Reset:

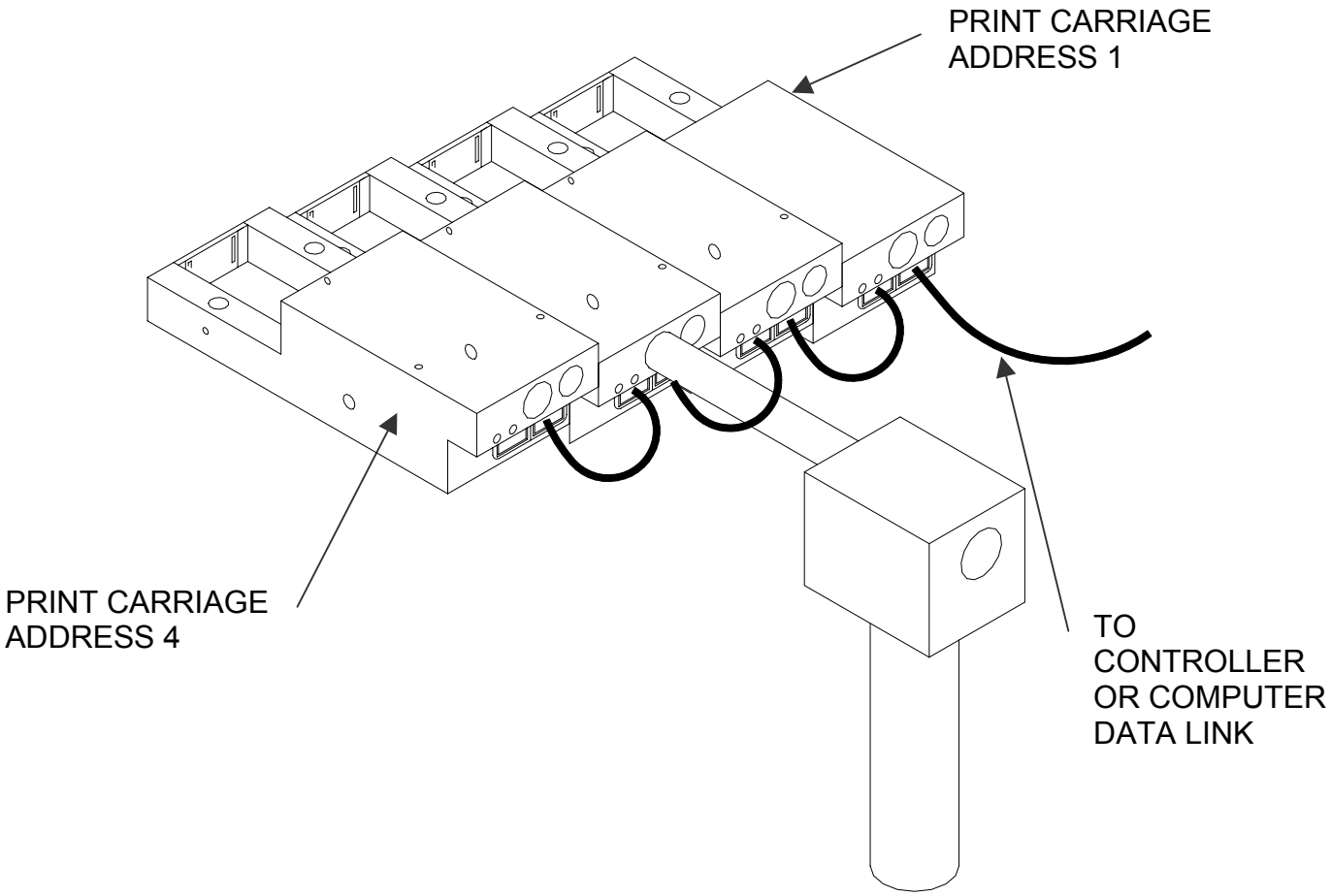
In the event it is necessary to perform a hard reset, disconnect the power cable, insert a standard paperclip into the hole located on the top of the cabinet, and while holding the paper clip in place (a light click will be felt) re-apply the power connector.
This operation will reset the print carriage assembly to the factory default settings and clear any current message.
Note: upgrading the system to a newer version of software will automatically perform this operation.

MULTIPLE PRINT HEADS

EVOLUTION printing systems have the ability to reside on a network. The network may contain from 1 to 32 print carriages connected via RJ50 cables. These cables are available in varying lengths depending on the application.
Each mounting bracket can support up to 4 print carriages and would typically interconnect with a 6” RJ50 data cable.

NOTE: Special care must be taken to connect the output of the first print carriage to the input of the next print carriage.

When connecting multiple print carriages place no more than 2 stations on a side of the mounting bracket as shown.



EVOLUTION SC QUICK START

```
EVSC    STOPPED
HD 1< - - SPEED=120

EVOLUTION SC
```

Connect the printer carriage to the appropriate power source.
Connect the controller to the carriage assembly. The controller derives power from the carriage.

On startup the LCD will display as pictured.

CHANGING LANGUAGE PROMPTS

```
< - -  SELECT  - - >
      ENGLISH
```

Press the F4 key [F4] and select [1] for LANGUAGE. Use the [◀] [▶] keys to select the desired language and press the [↵] to select the language.

ENABLING PRINT MODE

```
EVSC     PRINTING
HD 1< - -  SPEED=120

EVOLUTION SC
```

Press the GREEN PRINT key [⎙] to start printing

HEAD SELECT MODE

```
EVSC    STOPPED
HD 1< - -  SPEED=120

EVOLUTION SC
```

```
< - -  SELECT  - - >
WHICH HEAD =   1

EVOLUTION SC
```

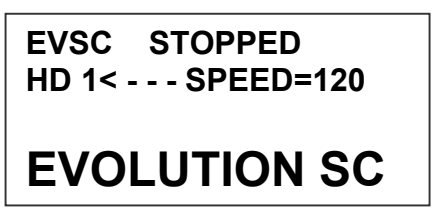
```
NO RESPONSE


ANY KEY TO EXIT
```

The hand held controller can program up to 32 print carriages on an RS485 data link. The factory default sets each print carriage to **ADDRESS 1.** Selection of another print head other than ADDRESS 1, press the key. Use the [◀] [▶] keys to select the alternate print carriage number and press the [↵] key. The print carriage whose address was selected will respond with the current message and appropriate parameters.

As an added convenience using the [◀] [▶] will auto scan to find the next available head connected to the environment

Accessing an address not associated with any print carriage will result in a no response message.

ENTERING A MESSAGE



Press the GREEN PRINT key
The LCD display will change from PRINTING to STOPPED.

Press the GREEN EDIT key

Press the BLUE F3 key F3 to delete the entire message

Press the BLUE FONT key to select the desired font size and enter the text EXP 12/10/04

Press the ENTER key to end the MESSAGE EDIT mode

Press the GREEN print enable key to enter the print mode

STORING A MESSAGE

EVSC STOPPED **HD 1< - - - SPEED=120** **EXP 12/10/04**	Press the GREEN STOP PRINT KEY **Note: There are a maximum of 100 messages stored.**
MESSAGE # 1 EVSC	Press the RED MESSAGE STORE key The LCD display will display the message storage screen Use the or to select the desired storage location
MESSAGE # 1 EVSC **MESSAGE STORED** **EXP 12/10/04**	Press the RED MESSAGE STORE KEY a second time and the current message appears in the selected location and is stored.
EVSC STOPPED **HD 1< - - - SPEED=120** **EXP 12/10/04**	Press the ENTER key to return to the command prompt.

LOADING A MESSAGE

EVSC STOPPED **HD 1< - - - SPEED=120** **EVOLUTION SC**	Press the GREEN STOP PRINT KEY **Note: There are a maximum of 100 messages stored.**
MESSAGE # 1 EVSC **PLEASE WAIT**	Press the RED MESSAGE STORE key **NOTE: The top line indicates that this message is for an EVSC – Evolution Small Character printer.**
MESSAGE # 1 EVSC **EXP 12/10/04**	Use the ◀ or ▶ keys to select the desired message
EVSC STOPPED **HD 1< - - - SPEED=120** **EXP 12/10/04**	Press the ENTER key
EVSC PRINTING **HD 1< - - - SPEED=120** **EXP 12/10/04**	Press the GREEN print enable key to enter the print mode

EVOLUTION SC QUICK SETUP

Install a new cartridge. Press the following keys in order:

REMAINING INK **100 %** **C NEW CARTRIDGE** **OTHER KEY EXIT**

To reset the ink level detector press

Each time a new print cartridge is installed the system automatically profiles the correct operating parameters for the new cartridge. These parameters set the required voltage and on time to produce consistent results without user intervention..

NOTE: USING OTHER THAN AUTHORIZED CARTRIDGES MAY CAUSE UNDESIRABLE RESULTS.

Press the GREEN print enable key to enter the print mode

To set the LINE SPEED, press to put the system in the Printing mode.
Set character width by

To set the PRINT DELAY press: to put the system in the Printing mode.
Set print delay by

. NOTE: Each increment or decrement changes the delay by the pre-defined amount.

You may continue to experiment with line speed and print delay until the desired code registration on the product is achieved.

PART 2: OPERATION PROCEDURES

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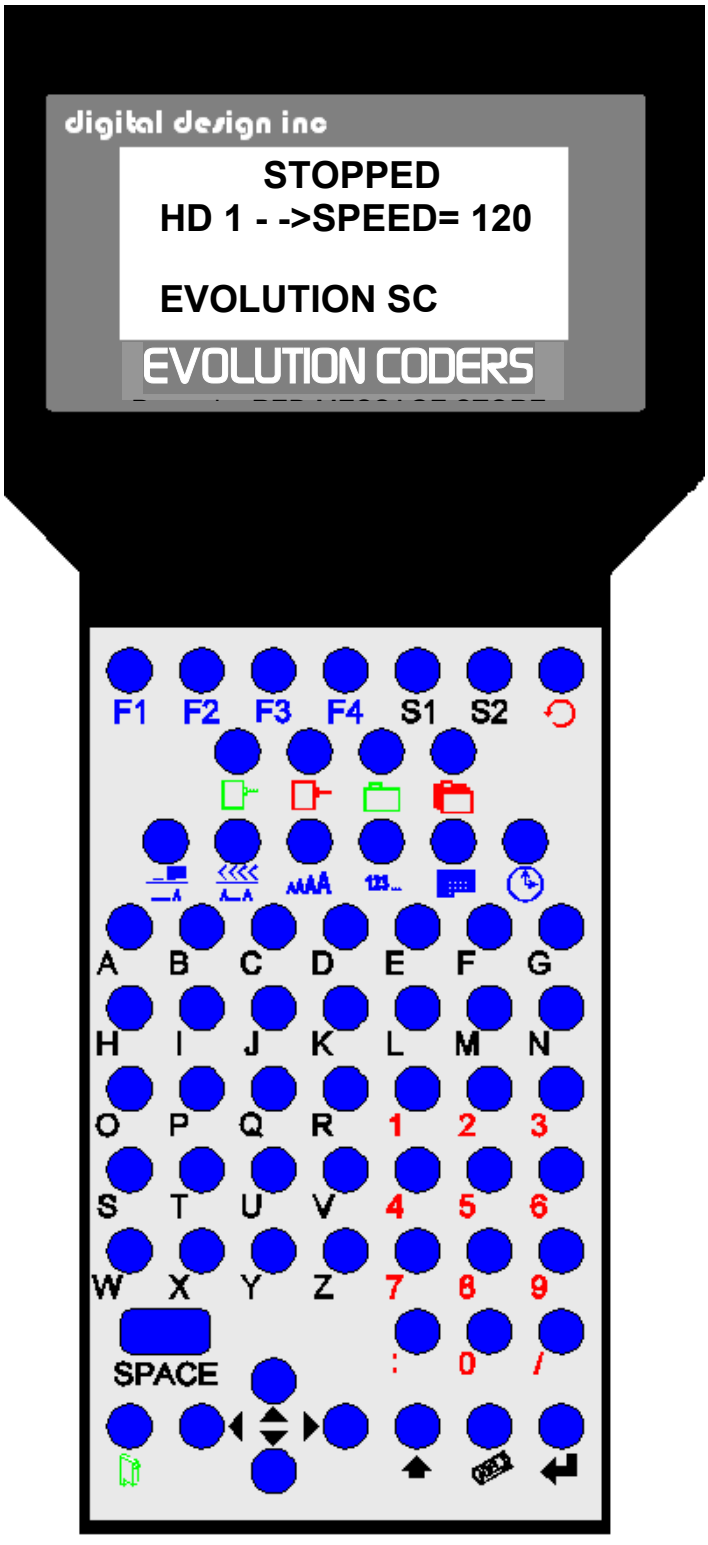
OVERVIEW
CONTROLLER and LCD


digital design inc
STOPPED
HD 1 - ->SPEED= 120
EVOLUTION SC
EVOLUTION CODERS
F1 F2 F3 F4 S1 S2
A B C D E F G
H I J K L M N
O P Q R 1 2 3
S T U V 4 5 6
W X Y Z 7 8 9
SPACE
: 0 /

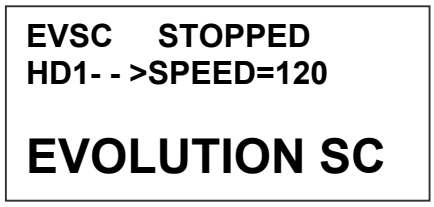
The keypad on the print station, pictured here, contains 64 keys. The LCD will display various messages to assist in programming on the upper half of the display. The lower half of the display will show up to two lines of the entered print message.
The system operates is 3 basic modes. They are: Print Mode, Command Mode, and Message Entry Mode. In Print Mode the majority of the keys on the keypad are disabled to avoid inadvertent changes. When in Print Mode the Top line of the LCD will display **PRINTING.**

The Command Mode is used to change the functions of the printer. When in the Command Mode the display will show **STOPPED** on the top line. The Message Entry Mode is used to create or modify printable codes, when in this mode the top line of the display will show **MESSAGE ENTRY**.
The 4 keys on the top row are the function keys F1 through F4. They each consist of submenus for modifying various printer functions. Their specific menus are detailed later in this section.
The next two rows of keys with icon legends directly control specific parameters of the printer as follows.

KEYPAD KEY DESCRIPTIONS

	This is the manual cycle key. When in the Stopped mode, pressing this key causes the printer to print one code
	This is the Print key. Use it to place the unit in the Print mode
	This is the Purge key. Use it to purge ink for maintenance purposes. The unit must be in the Command mode to use this key.
	This is the Head Select key. Use it to select the address of the head to be communicated with. In edit mode it enters the DAY of WEEK
	Use this arrow to decrease values, and use it to move the cursor in the message line while editing the message.
	Use this arrow to increase values and use it to move the cursor in the message line while editing the message.
	Use this arrow to move the cursor between the message lines while in Edit mode and building a message.
	Use this arrow to move the cursor between the message lines while in Edit mode and building a message.
	This key is the Message Storage key. Use it to store and to recall individual codes.
	This is the Delete key. Use it to backspace to delete a character when mistyped as well as to exit from certain menus.
	This is the Message Entry key. Use this key to enter the Message Entry mode, to input a code or to edit a code.
	This is the Date key. Use this key to enter the Date in Message Entry Mode. Change Date in STOPPED mode.
	This is the Time key. Use this key to enter the Time in Message Entry Mode. Change Time in STOPPED mode.
123...	This is the Sequence Number key. Use this key to enter the Sequence Number in Message Entry Mode. Command mode sets count parameters
	This is the Enter or Return key. When pressed, the unit will accept input and exit certain menus.
	This is the Print Delay key. In Message Entry Mode this is the DATE OFFSET FUNCTION
	This is the Line Speed key. In Message Entry Mode this is the SHIFT CODE FUNCTION
	This key selects the Font size in the EDIT mode. In the COMMAND mode pressing this key displays the current fonts loaded in the print head.
S1	Pressing this key while in the Message Entry mode accesses special characters
S2	This key is reserved for special customer Logos

TURNING ON THE PRINT STATION FOR THE FIRST TIME



To turn the print station on insert the power jack into the DC power connector.

There is no on/off switch.

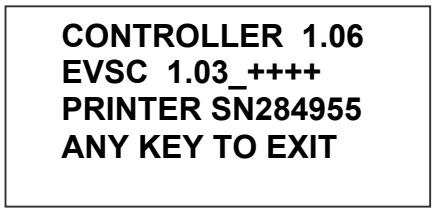
The first time the print station is turned on, as received from the factory, the LCD will look like the illustration on the left. Each line gives important information regarding the system:

The Top line indicates the **PRINT SYSTEM TYPE** and the operating mode of the unit: "STOPPED" when in Command mode, " PRINTING" when in Print mode, and "MESSAGE ENTRY when in message entry.

The 2nd line shows the print head currently selected, the direction of travel for the product and the programmed SPEED.

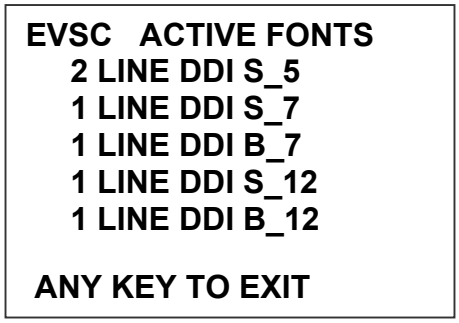
The lower half two lines of the display shows the message entered for printing. This may represent one or two lines of code.

CHECKING SYSTEM INFORMATION



Verify system information by pressing the V key on the hand held controller keyboard. The LCD screen will display the software, firmware, serial number and options enabled. Enabled options are indicated on the second line as a series of + characters where the first + indicates option pack 1, the second + indicates option pack 1.5 and the last + indicates option pack 2.

CHECKING LOADED FONTS



Press the FONT AAA key in the COMMAND mode to check what fonts are currently loaded in the print head.

NOTE: The Evolution small character has 5 font styles:

12x9	**1 line of text**
12x9 bold	**1 line of text**
7x5	**1 line of text**
7x5 bold	**1 line of text**
5x5	**2 lines of text**

CHANGING SYSTEM DATE AND DAY OF WEEK CODES

PRESENT SETTING
ANY CHANGES Y/N
01/04/00

When the unit is in the STOPPED mode pressing the DATE key allows the user to change the system date. If there are no changes press the N key to return to the STOPPED mode.
Press the Y key to change the date.
The system will prompt the user first for the Month (enter 2 digits), then the Day (2 digits) and finally the year (2 digits).

PRESENT SETTING
ANY CHANGES Y/N
01/04/00
ENTER MONTH-

PRESENT SETTING
ANY CHANGES Y/N
01/04/00
ENTER DAY-

PRESENT SETTING
ANY CHANGES Y/N
01/04/00
ENTER YEAR-

< - - SELECT - - >
DAY OF WEEK- 1

After the date is entered the system requests the actual date day of week. This parameter is usually set to 1 for Sunday, 2 for Monday etc.

DAY FORMAT
1= NUMERIC
2= LETTERS

The day of the week can be entered into a message as either a number 1-7 or as a letter A-G. The day of the week is entered into a message by pressing the key.

PRESENT SETTING
ANY CHANGES Y/N
04/23/05

After the data is entered the system displays the currently entered date and pressing the N key returns the user to the STOPPED mode, or press Y to the correct the date.

CHANGING SYSTEM TIME AND DATE ROLL OVER TIME

TIME SETTINGS
1= SET TIME
2= DATE CHANGE TIME

Changing the system time is accomplished by selection option 1.

PRESENT SETTING
ANY CHANGES Y/N
23:05

Select the N key if the time is correct and return to the STOPPED mode.

PRESENT SETTING
ANY CHANGES Y/N
23:05
ENTER HOURS -

Press the Y key to change to the correct time. Enter the correct hours (2 digits) followed by the correct minutes (2 digits). The screen displays the corrected time. Press the Y key to make further changes or N key to return to the STOPPED mode.

PRESENT SETTING
ANY CHANGES Y/N
23:05
ENTER MINUTES -

Notice the time is in 24-hour format.

PRESENT SETTING
ANY CHANGES Y/N
13:50

TIME SETTINGS
1= SET TIME
2= DATE CHANGE TIME

The Date Change option is enabled by selecting option 2. This feature allows the date to roll over at a specified time other than 12:00AM (midnight). For example if the start of a new shift day occurs at 6:00AM the date will be changed each day at 6:00AM.

DATE TIME CHANGE
ANY CHANGES Y/N
00:00

Selecting Y allows changing of the roll over time. Setting this parameter to 00:00 disables the function.

DATE TIME CHANGE **ANY CHANGES Y/N** **00:00** **ENTER HOURS -**	Similar to entering the time enter first the hours then at the next prompt enter the minutes. Remember the time is entered in military time.
DATE TIME CHANGE **ANY CHANGES Y/N** **00:00** **ENTER MINUTES -**	Entering 06:00 sets the date change time at 6:00AM.
RESET CLOCK **ENTER HOURS -**	Enabling this function requires resetting the current correct time.
RESET CLOCK **ENTER MINUTES -**	Enter both the current time in hours and minutes. This resets the correct time and establishes a new Date Rollover Time.

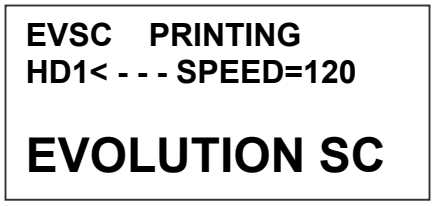
PROGRAMMING

DEFINITIONS

There are two parts to programming the EVOLUTION SC ink jet printer,

- setting the operations parameters, (character width, delay, etc.) and
- building the message.

PRINT MODE AND STOPPED "Command" MODE

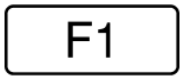


When in the Print mode the screen will look like the screen on the left. When PRINTING is seen on the LCD, the unit will print as product passes in front of the carriage assembly. To enter Print mode, press .

When in the Command Mode the screen looks like the illustration at left. When STOPPED the printer will not print when product is moved past the carriage assembly.
In Command mode, access can be made to the menus under the function keys, **F1** through **F4** icon control keys plus access to Message Entry Mode. To enter Command mode, press .

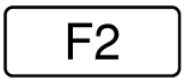
MENU STRUCTURE

In the Command mode, access is allowed to the menu structure for basic parameters. The menus reside within the function keys, **F1** through **F4**. In order to select one of the parameters, press the number key that corresponds to the desired parameter.



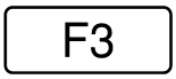
The **F1** key, when pressed, brings up the menu as shown below.

1=CHAR. SPACING
2=EXT. ENCODER
3=DATE OFFSET
4=NOT AVAILABLE



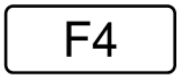
The **F2** key, when pressed, brings up the menu as shown below.

1=DIRECTION
2=PRINT INVERSE
3=NOT AVAILABLE
4=AUTO REPEAT



The **F3** key, when pressed, brings up the menu as shown below.

1= PRODUCT COUNT
2= SHIFT CODE
3=DATE FORMAT
4=TIME FORMAT



The **F4** key, when pressed, brings up the menu as shown below.

1=LANGUAGE
2=INK SUPPLY
3=SET UNIT I.D.
4=NOT AVAILABLE

F1 MENU

```
1=CHAR. SPACING
2=EXT. ENCODER
3=DATE OFFSET
4=NOT AVAILABLE
```

Place the unit in the Command mode and press F1. The screen shown to the left is produced. Press the correct number to make changes to that parameter. Those selections designated as NOT AVAILABLE will not respond to selection. They are reserved for future system expansion.

1 = CHARACTER SPACING:

```
< - - SELECT - - >
# OF SPACES-    1
```

This parameter controls the amount of space between characters in the code. Spacing can be varied from 1 to 25 columns. Use this control to make printed codes more legible when code is compressed. Press the 1 then press ▶ or ◀ to change the value. Press ↵ once the desired value is displayed.

2 = EXT. ENCODER:

```
ENCODER
1=INTERNAL
2=EXTERNAL
```

Press 1 to select internal time base. This parameter controls the source of the time base used for printing. Each vertical column printed requires a signal necessary to produce a character representative of the line speed of the production line. The printer can be set to produce a perfect aspect ratio character (96 dpi vertical and horizontal) or compressed by setting the print head line speed faster than the actual line speed, or expanded by changing the internal speed slower than the actual line speed.

In the event there is an acceleration or deceleration to the production line, or there is a requirement to guarantee accurate aspect ratio, an external encoder is necessary. Press 2 to select external encoder. While external encoder is selected the LINE SPEED key will adjust the expansion and compression of the printed message. Selecting the correct encoder is important to allow for both compression and expansion of printer text. The correct aspect ratio can be calculated as follows:

Swath height is 0.125 (1/8”) / 12 vertical dots = 0.0104” between vertical dots

Therefore to print a perfect ratio character requires an encoder pulse every 0.0104”. The encoder range adjustment is from 0 to 7 and assuming the mean is a count of 4 then by connecting an encoder that produces a pulse for each 0.0026” the correct character aspect ratio can be achieved. This allows to both compress or expand the printed text.

3 = DATE OFFSET:

DATE OFFSET **USE KEYS 0->9** **# OF DAYS = 100**

To enter a date offset (expiration date) change the value equal to the number of days until expiration. Legal entries are 0 to 999 days.

F2 MENU

```
1=DIRECTION
2=PRINT INVERSE
3=NOT AVAILABLE
4=AUTO REPEAT
```

Place the unit in the Command mode and press F2. The screen shown to the left is produced. Press the correct number to make changes to that parameter

1 - DIRECTION:

```
< - - SELECT - - >
LINE DIRECTION
      < - - - -
```

The arrow shown on the LCD's third line screen should agree with the direction of product travel. Press ▶ or ◀ to change direction. Press ↵ for the unit to accept the change.

2 - PRINT INVERSE:

```
CODE ORIENTATION
1 = NORMAL PRINT
2 = UPSIDE DOWN
```

This parameter allows the code to print right side up or upside down. Pressing 2 will produce the following screen. Press 1 for normal print or 2 for upside down codes. Save the choice by pressing ↵. Look for the change of direction on the imprint.

3 – NOT AVAILABLE:

4 - AUTO REPEAT:

```
< - - SELECT - - >
REPEAT TIME= 0
```

This option enables the unit to continuously print repeated codes at specified time intervals along the entire length of the product. A time of 0 disables the Auto Repeat option. Use ◀ or ▶ to change the repeat time. Each number in the time delay adds or subtracts a distance equivalent to the pre-defined setting. Save your choice by pressing ↵. The maximum repeat spacing is 255 counts where each count is equal to 2 character columns or 0.020". This allows for a total displacement of 5.31". Setting a print delay that uses the same mathematical equation can increase this number. Thus a total displacement of 10.62" can be realized.

F3 MENU

1= PRODUCT COUNT
2= SHIFT CODE
3= DATE FORMAT
4= TIME FORMAT

1 – PRODUCT COUNT:

PRODUCT COUNTER
CHANGES Y/N OR C
08:00 - - > 17:00
COUNT = 000000

The product counter is a non-printable entity, and must be read after the end of the set time period. The counter indicates each print cycle sensed by the external photo eye. The counter may be cleared by depressing the **C key.**

PRODUCT COUNTER
START TIME
08:00 - - > 17:00
ENTER HOURS -

If there are no changes press the **N key.**

To change the settings depress the **Y key.**
All times are in Military Time 00:00 to 23:59 hours.

PRODUCT COUNTER
START TIME
08:00 - - > 17:00
ENTER MINUTES -

Enter the start time HOURS.
At the next screen prompt enter the start time MINUTES

PRODUCT COUNTER
STOP TIME
08:00 - - > 17:00
ENTER HOURS -

The system then prompts the user for the STOP TIME.

PRODUCT COUNTER
STOP TIME
08:00 - - > 17:00
ENTER MINUTES -

Enter both the stop time HOURS and then the MINUTES.

PRODUCT COUNTER
CHANGES Y/N OR C
08:00 - - > 17:00
COUNT = 000000

The newly entered data is re-displayed for verification or correction if necessary Press the **Y key** to change the data or the **N key** to finish and return to the **STOPPED MODE**

2 – SHIFT CODE:

1= PRODUCT COUNT **2= SHIFT CODE** **3= DATE FORMAT** **4= TIME FORMAT**	Shift codes may be encoded directly in the printable message. The printer can print 6 individual shift codes. Each shift code contains a unique start time and alpha/numeric code to be printed.
ADJUST SHIFTS **< - - SELECT - - >** **SHIFT 1 07:00 A** **ANY CHANGES Y/N**	Press ▶ or ◀ to change the desired shift to view or change.
ADJUST SHIFTS **SHIFT 1** **START TIME** **ENTER HOURS -**	Enter the correct start time HOURS (military time) for the shift selected.
ADJUST SHIFTS **SHIFT 1** **START TIME** **ENTER MINUTES -**	Enter the correct start time MINUTES (military time) for the shift selected.
ADJUST SHIFTS **SHIFT 1** **PRINT CODE =**	Finally, enter the desired code to be printed in the message. Legal characters are the letters A to Z and the numbers 0 to 9.
ADJUST SHIFTS **< - - SELECT - - >** **SHIFT 1 07:00 A** **ANY CHANGES Y/N**	The printer re-displays the data for the selected shift for verification. **NOTE: THIS PROCEDURE MAY BE REPEATED FOR ALL DESIRED SHIFTS**.

3 – DATE FORMAT:

1= PRODUCT COUNT
2= SHIFT CODE
3= DATE FORMAT
4= TIME FORMAT

Press **F3** to change the date formatting. Each of the following screens prompts the user to enter the desired format for printing.

NOTE: THE USER MAY INDIVIDUALLY CHANGE THE FORMAT OF BOTH THE CALANDER FORMAT AND THE DATE OFFSET FORMAT

NOTE: THE FOLOWING PROCEDURE APPLYS TO BOTH CALANDER AND OFFSET DATE FORMATS.

CHANGE FORMAT
1=CALANDER DATE
2=OFFSET DATE
3=WEEKLY DATE

Selecting the standard numeric format will prompt the user to enter the format of the date in standard number format.

MONTH FORMAT
1=NUMERIC
2=LETTERS

DATE FORMAT
D=DAY M=MONTH
Y=YEAR J=JULIAN
dm/dd/dy

The default as shipped from the factory is dm/dd/dy, and may be modified as required.

To change the format press the delete key and the last line on the display will be erased. The entire format will be erased and must be re-entered.

DATE FORMAT
D=DAY M=MONTH
Y=YEAR J=JULIAN
jjj

Press either of the designator keys (ie M for month) and the display will display the correct code for the item selected. As an example enter the Julian date and year. Press the J key followed by the Y key. The code entered will print the Julian date followed by the 2-digit year. Notice no delimiters were selected, but may have been entered by selecting the appropriate key on the keyboard. Legal delimiters are the colon (:), the forward slash (/) or the period (.).

DATE FORMAT
D=DAY M=MONTH
Y=YEAR J=JULIAN
jjjyy

MONTH FORMAT **1=NUMERIC** **2=LETTERS**	Alpha month characters are selected by pressing option 2.
DATE FORMAT **D=DAY M=MONTH** **Y=YEAR** **jjjyy**	Delete the current formatting by pressing the Delete key.
DATE FORMAT **D=DAY M=MONTH** **Y=YEAR** **ddmmmyy**	Enter the desired Date Format and notice when the M (month) is selected the display shows mmm. Select the appropriate key on the keyboard by entering in the desired code. Press the Enter key to return to the STOPPED mode.
WEEKLY DATE **1=ENABLE** **2=DISABLE**	Option 3 performs a special function allowing the user to set the current date to change only at a certain day of the week. This function is typically used in batch processing, where a batch may be prepared on Sunday and packaged from Monday through Friday of the following week.

Entering either the current date or offset date in a message will result in the initial date being printer for either function throughout the following week. Selecting option 2 returns the user to the STOPPED mode.

4 – TIME FORMAT:

```
1= PRODUCT COUNT
2= SHIFT CODE
3=DATE FORMAT
4=TIME FORMAT
```

Change the Time Format by selecting option 4.

```
      TIME FORMAT
H=HOURS
M=MINUTES
hh:mm
```

The factory default for time formatting is hh:mm and may be changed as required. Press the Delete key and the last line on the display is erased.

```
      TIME FORMAT
H=HOURS
M=MINUTES
hh
```

Enter the desired format by pressing the H and or M keys, and select delimiters as required. Select H if only hours are required.
Press the Enter key to return to the STOPPED mode.

F4 MENU

```
1 = LANGUAGE
2 = INK SUPPLY
3 = SET UNIT I.D.
4 = LOAD CARD
```

Place the unit in the Command mode and press F4. The screen shown at left is produced. Press the number that corresponds to the parameter you wish to change.

1 - LANGUAGE:

```
< - -   SELECT   - - >

        ENGLISH
```

Press 1 and the screen will change like the one on the left. The default language is English; the other choice is Spanish. Scroll through the choices using either ◄ or ►. Once the desired language is shown on the screen, press ↵. This will return the unit to the Command mode. Whenever language is chosen, all prompts and commands shown on the screen will be in that language.

2 - INK SUPPLY:

```
REMAINING INK
        100
C NEW CARTRIDGE
OTHER KEY EXIT
```

The second line of the display shows the percentage of ink remaining in the print cartridge.

Each time a new cartridge is installed the user must reset the system ink gauge by pressing the **C** key.

When a C is entered the system automatically profiles the operating conditions for the new cartridge.

Each cartridge is tested at the factory and uses specially formulated and proprietary inks. The correct drive voltage, pulse width timing and pre-fire pulse warming may be adjusted for optimum operation.

NOTE: USING NON-AUTHORIZED CARTRIDGES WILL PRODUCE UNDESIRABLE RESULTS

3 – SET UNIT I.D.:

< - - SELECT - - >
SET HEAD # = 1

Each print carriage can contain a unique address to distinguish multiple carriages when controlled by a single hand held controller or computer data link using an RS485 protocol. The default for each new print carriage module is ADDRESS 1. Addresses can range from 1 to 32. It is advisable when adding multiple print carriages to affix a label indicating the unique ADDRESS number of the individual carriage.

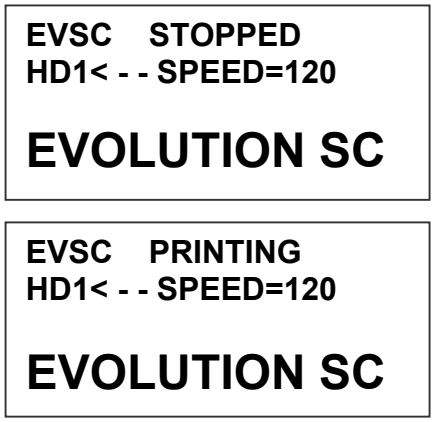
NOTE: To program a carriage it must be connected directly to the hand held controller, with no other PRINTHEADS connected.

4 – NOT AVAILABLE:

SETTING PRINT DELAY AND LINE SPEED

LINE SPEED – This setting adjusts the width of the printer message on the product. This setting should be adjusted to produce the desired print on the product. Line speed can be increased or decreased to stretch or compress the message to fit the desired print area.

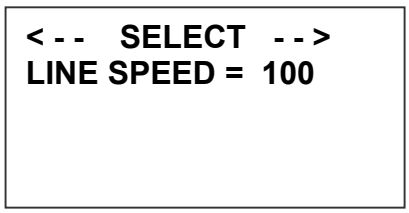
PRINT DELAY – This setting adjusts the location of the printed message on the product.



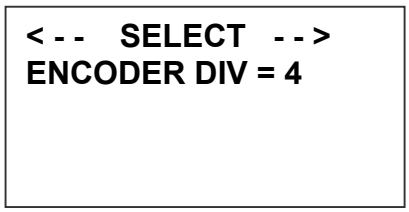
Access to these parameters is possible when the unit is in either the STOPPED or PRINTING mode as shown to the left.

Pressing the A delay key allows the user to determine the amount of print delay. Each count at a normal aspect ratio is approximately 0.0208". This will vary according the amount of compression or expansion used.

SETTING LINE SPEED

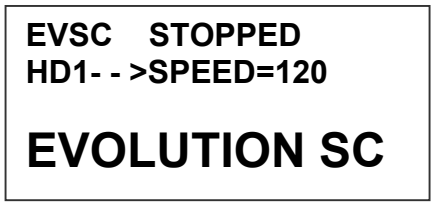


Normally, the system will be set to use the internal time base for line speed control. The default value is 100, which creates a normal width character on a line moving at 100 ft per min. The print can be narrowed by increasing the number and widened by decreasing the number. Pressing A..A accesses this parameter. Once pressed, a new screen appears, as shown to the left. Changes can now be made by using ◀ or ▶. The range of values for character width is 1 to 200. Once the desired number is chosen, press ↵ to save your entry.



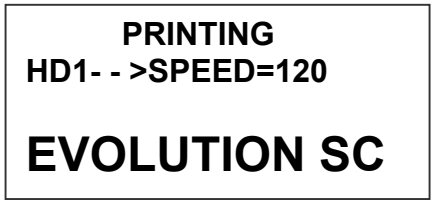
If external encoder is enabled and the unit is in the PRINTING mode the user has the option of adjusting the compression ratio of the printer message. Changes may be made by using ◀ or ▶. Once the desired number is chosen, press ↵ to save your entry.

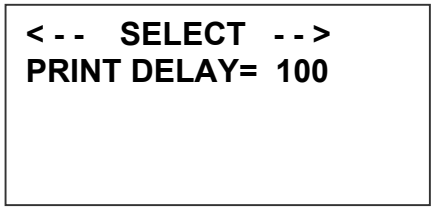
SETTING PRINT DELAY



Print delay is used to position a message on the product at a location other than at the leading edge. Access this parameter by pressing on the keypad.

NOTE: This parameter may be set when the unit is either in the PRINTING or STOPPED mode



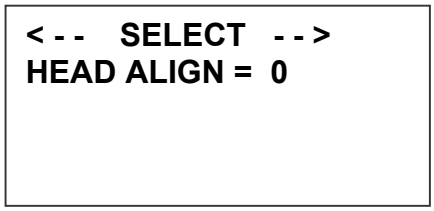


To change the value use either or . The range of values for this parameter is 1 to 255. Each increment represents 2 columns, approximately .0208" (.5mm). Therefore, a delay of 255 would approximate 5.3" (135mm). Once a number is chosen, press to save the entry.

NOTE: THE DIMENSION INDICATED IS WHILE PRINTING A PERFECT ASPECT RATIO CHARACTER. WHEN PRINTING A COMPRESSED OR EXPANDED CHARACTER THE ACTUAL DIMENSIONAL NUMBER WILL BE DIFFERENT BUT CAN BE ESTIMATED BASED ON THE 18 COLUMNS PER COUNT.

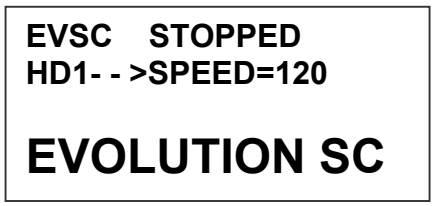
NOTE: Setting the line speed first, then adjusting the print delay may prove to be the best starting point

SETTING HEAD ALIGNMENT



Aligning the vertical print for messages in multiple print heads is fine-tuned with an additional feature found in either the PRINTING or STOPPED mode. Pressing the letter O on the keyboard accesses this feature.
A count of 0 disables this feature while using the arrow keys allows the user to fine-tune the print head alignment. Valid selections are from 0-16.

INPUT, EDIT OR DELETE MESSAGES



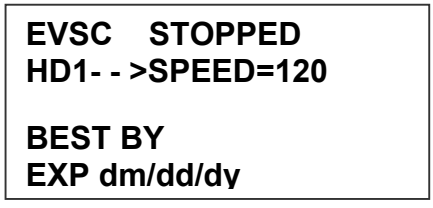
To input, delete or edit a message, the unit must be in the STOPPED Mode. If the LCD reads PRINTING, press . The screen should be similar to the one shown at the left.

Enter the Message Entry mode by pressing . The top portion of the screen will change as shown on the left.

The user has two options to edit or change a message. If a new message is to be entered press the F3 key to delete the entire existing message.

For example, to produce a single line of text. Press the font key until the S12 font size is shown, and enter EXP followed by the key. This enters the date offset as defined in the F1menu.

The message shown to the left would be an example if the 1 LINE font were used.



To place two lines use the to select 2 LINE size. Press the F3 to delete the entire message. Press the or to select which line the data will be entered on. Enter BEST BY. The pictorial at the left shows two lines of 2 LINE character size. To enter and print only 1 line of 2 LINE select the line and enter data to that line only.

Once the message line(s) is complete, save the change by pressing .

NOTE: USE THE DATE OFFSET KEY TO ENTER AN EXPIRATION DATE.

```
 MESSAGE ENTRY
- - - - FONT- 1   S12

PRICE $ 1.29/10
```

```
 MESSAGE ENTRY
- - - - FONT- 1   S12

PRICE $
```

The second option is to replace characters by using the key or moving the cursor over a character to be replaced. When the MESSAGE ENTRY mode is entered the cursor is placed at the end of the line. Pressing the key will delete the last character on the line. Successive 's will continue to delete the last character on a line.
At the left the characters 1.29/10 were deleted.

```
 MESSAGE ENTRY
- - - - FONT- 1   S12

PRICE $ 1.75/12
```

Enter the correct data, in this case 1.75/12.

```
 MESSAGE ENTRY
- - - - FONT- 1   S12

PRICE $ 1.75/12
```

The alternative approach if just a few characters are to change is to use the or to place the cursor over the characters to be changed and retype the correct characters. In this example the 1.29/10 WAS CHANGED TO 1.75/12

```
< - -   SELECT   - - >
 !#$&( )*+=¢■ŇÉŐ
```

Symbols are inserted by pressing S1. When in Message Entry mode, position the cursor where a symbol is needed and press S1. The screen will show a line of symbols as presented on the left. Position the cursor by pressing or on the special character to be inserted and press .

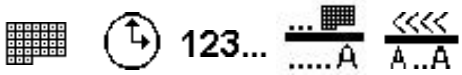
```
EVSC   STOPPED
HD1- - >SPEED=120

PRICE $ 1.75/12
```

Continue to build the message or press to return to the Command mode.

MESSAGE ENTRY
- - - - FONT- 1 S12

Enabling variable field programming requires the use of the special function keys.



MESSAGE ENTRY
- - - - FONT- 1 S12
DM/DD/DY

To enter a date that automatically changes use the key. The current date format as set in the F3 menu is entered into the message.

MESSAGE ENTRY
- - - - FONT- 1 S12
HH:MM

To enter a time that automatically changes use the key. The current date format as set in the F3 menu is entered into the message.

MESSAGE ENTRY
FONT- 1 S12
0000

Sequence numbers may be added to a message with the 123... key. Note when the key is depressed the four ---- are changed to #### indicating a sequence number field. After entering the correct sequence number press the 123... key to terminate the sequence field. The maximum number of digits allowable is 9 numeric characters.

MESSAGE ENTRY
- - - - FONT- 1 S12
0000

MESSAGE ENTRY
- - - - FONT- 1 S12
DM.DD.DY

Date offset codes are entered by using the key.
The correct date offset format as defined in the F3 menu is entered into the message

MESSAGE ENTRY
- - - - FONT- 1 S12
S

Finally use the key to enter a shift code.
Shift codes are defined in the F3 menu and will automatically change at the appropriate shift times. The shift designator S is displayed to indicate the data entry.

MESSAGE ENTRY
- - - - FONT- 1 S5
MFG DM/DD/DY HH:MM
EXP DM.DD.DY S 0009

For purposes of clarity the font sized is changed to S5 allowing a number of parameters to be displayed. The first line contains the alpha characters MFG followed by the key then a space and the key. The second line has the alpha characters EXP followed by the the key. Then a shift code is entered, followed by a 4-digit sequence number using the 123... key.

SEQ. NUMBER
1= COUNT UP
2= COUNT DOWN

Sequence number format is programmable in the STOPPED mode. The counter may be set to count either up or down by selecting number 1 or 2. Pressing enter advances the user to the next menu prompt.

CLEAR SEQ# FIELD

YES OR NO Y/N

Clearing the sequence field resets the counter to their initial settings.

COUNTER LIMIT

ANY CHANGES Y/N
ENTER #000000000

COUNTER LIMIT

ANY CHANGES Y/N
ENTER #000005000

The next prompt allows for changes in the sequence limit field. Selecting Y allows the user to enter the desired maximum (minimum for down count) count. Digits are enter via the keyboard right justified. As an example to set a maximum count of 5000 enter 5000. Pressing the DEL key allows for re-entry while pressing the ENTER key returns the user to the STOPPED mode.

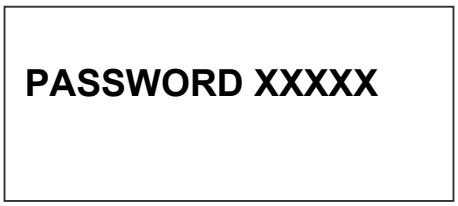
Moving the cursor back over the various characters contained in the message may be used to validate the message. Note that the field designator will normally appear as - - - - indicating an alpha/numeric code as would be seen by moving the cursor under the M F G or the E X P on the second line. The same designator will be seen when the cursor is placed under any non-changeable field including the space character.
Moving the cursor under a variable programmable field will display the correct field designator in place of the - - - - alpha/numeric designator.

MESSAGE ENTRY
- - - - FONT- 1 S5
MFG DM/DD/DY HH:MM
EXP DM.DD.DY S 0009

For example, moving the cursor under the S (shift code) on the second line would display the field designator as < < < <

The various field designators displayed are:
- - - - Alpha/Numeric non-changeable data
Sequence number field
< < < < Shift code field
OM Offset date month field
OD Offset date day field
OY Offset date year field
DM Current date month field
DD Current date day field
DY Current date year field
TH Current time hour field
TM Current time minute field

PASSWORD PROTECTION



The EVOLUTION SC contains a password function designed to limit access to the edit menu and prevent unauthorized changing of message lines. To activate this function, switch the unit off, then press and hold [P] while switching the unit on. The display changes and requests the default password (which is 12345). Enter the 12345.

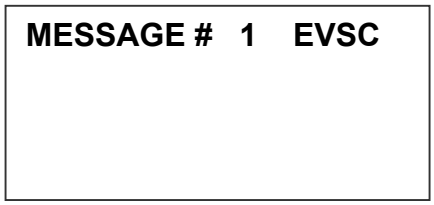
The screen to the left appears and prompts the operator or ENABLE PASSWORD

A response of N maintains the current password and disables password protection.

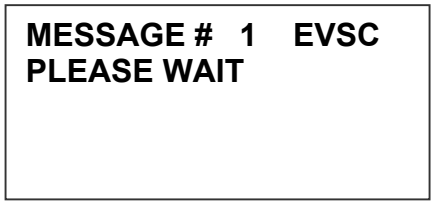
If the response Y is selected the screen at the left appears to prompt the user to enter a new password. Enter the new 5 character password any combination of letters and numbers may be used. Once this has been completed, the unit will not allow message editing without the entry of the password.

If the new password is misplaced or forgotten, reset the unit.

MESSAGE STORAGE
STORING A MESSAGE



All EVOLUTION SC printers are able to store up to 100 system wide programmed messages and their associated parameters. Follow these steps to store a message. Create the message and press ↵. Press . Using ◄ or ►, scroll to the desired message location number.



Press a second time. This places the message into that numeric location for recall at a later time. Use the same procedure to overwrite an existing stored message as well.

The LCD display will indicate that the message is stored.

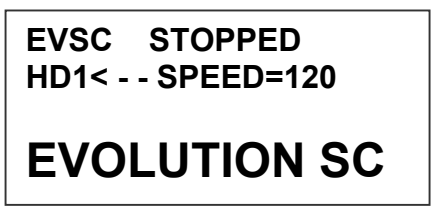
Press to exit.

NOTE: Message storage should be used after the product has been coded satisfactorily. When a message is stored all operating parameters of the printed code are saved. Once recalled, codes will be printed the same as they had been before.

NOTE: EACH STORED MESSAGE WILL SHOW THE SPECIFIC UNIT THAT THE MESSAGE WAS CREATED FOR.

RECALLING A STORED MESSAGE

Place the unit in "Stopped" mode and press . Use the ◄ or ► to scroll through the stored messages. Find the desired message and press ↵. That message is now displayed on the screen ready for printing.



PART 3: MAINTENANCE PROCEDURES

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Long Periods of Shutdown 3-3
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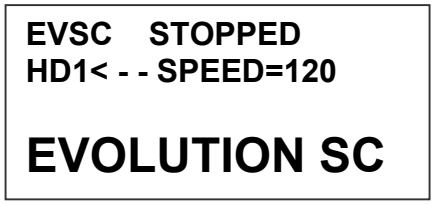
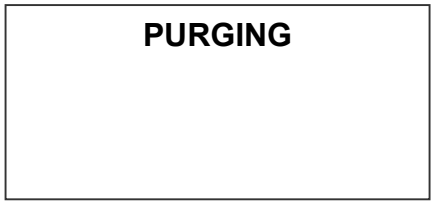
PRINT CARRIAGE MAINTENANCE 3-5
EXPLODED VIEW OF PRINT CARRIAGE 3-5

PERIODS OF SHUTDOWN
SHORT PERIODS OF SHUT-DOWN

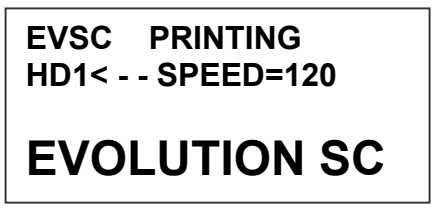
When the printer has been shut down overnight, the system might require a purge to clear out dust particles that have settled on the nozzle area during non-use. This is only necessary if there are missing dots in the printed code on product.



To purge be sure that the unit is in the STOPPED Mode by pressing green key. The screen changes to STOPPED as shown to left.



Place a piece of lint free wipe (or absorbant paper) in front of the print head and press the red . Allow the unit to purge for several seconds. There is an automatic shut down after a preset time period to ensure that the print head will not be damaged. If ink residue has solidified on the nozzle area a small drop of water may be applied to the lint free wipe.
When purging is complete the LCD will be returned to the STOPPED mode.

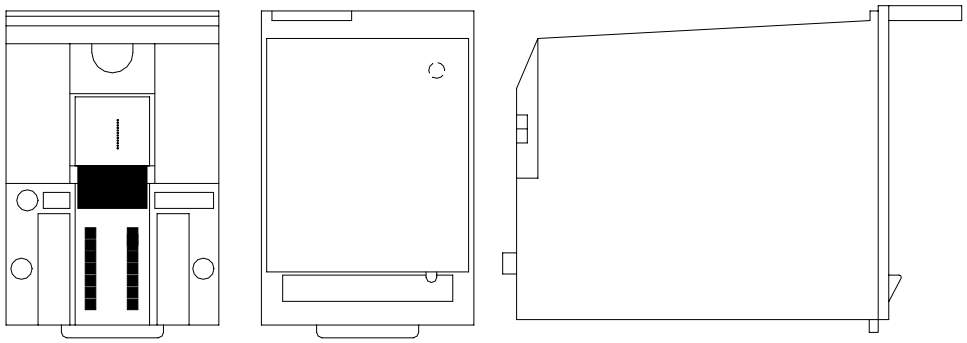


Press the green and the screen changes to PRINTING, as shown at the left. The unit is ready to begin coding.

LONG PERIODS OF SHUT-DOWN

When the printer is to be shut down for extended periods, or the ink cartridge needs to be changed to insert a different color cartridge, the ink cartridge should be removed.
Clean the print head nozzle area with a soft, lint free wipes and insure there is no ink residue remaining on the nozzle area. Re-apply the sealing tape. The print cartridge may be stored in a sealable plastic bag.

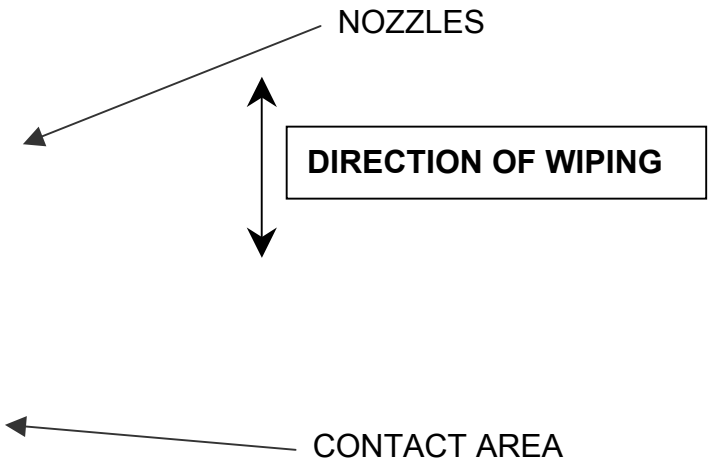
CAUTION: USE THE ORIGINAL SEALING TAPE SUPPLIED WITH THE EVOLUTION SC INK CARTRIDGE. DO NOT USE ANY OTHER MATERIAL OR ANY ADHESIVE BACKED PRODUCT, AS THIS WILL DAMAGE THE NOZZLE AREA.



PRINT CARTRIDGE MAINTENANCE

It is necessary to maintain the EVOLUTION SC print cartridge free from accumulated dust and debris. Periodically the cartridge should be removed and cleaned. This is totally dependent on the operating environment and the average printable life of the ink cartridge. In extremely dusty environments, this maintenance procedure may be required regularly.

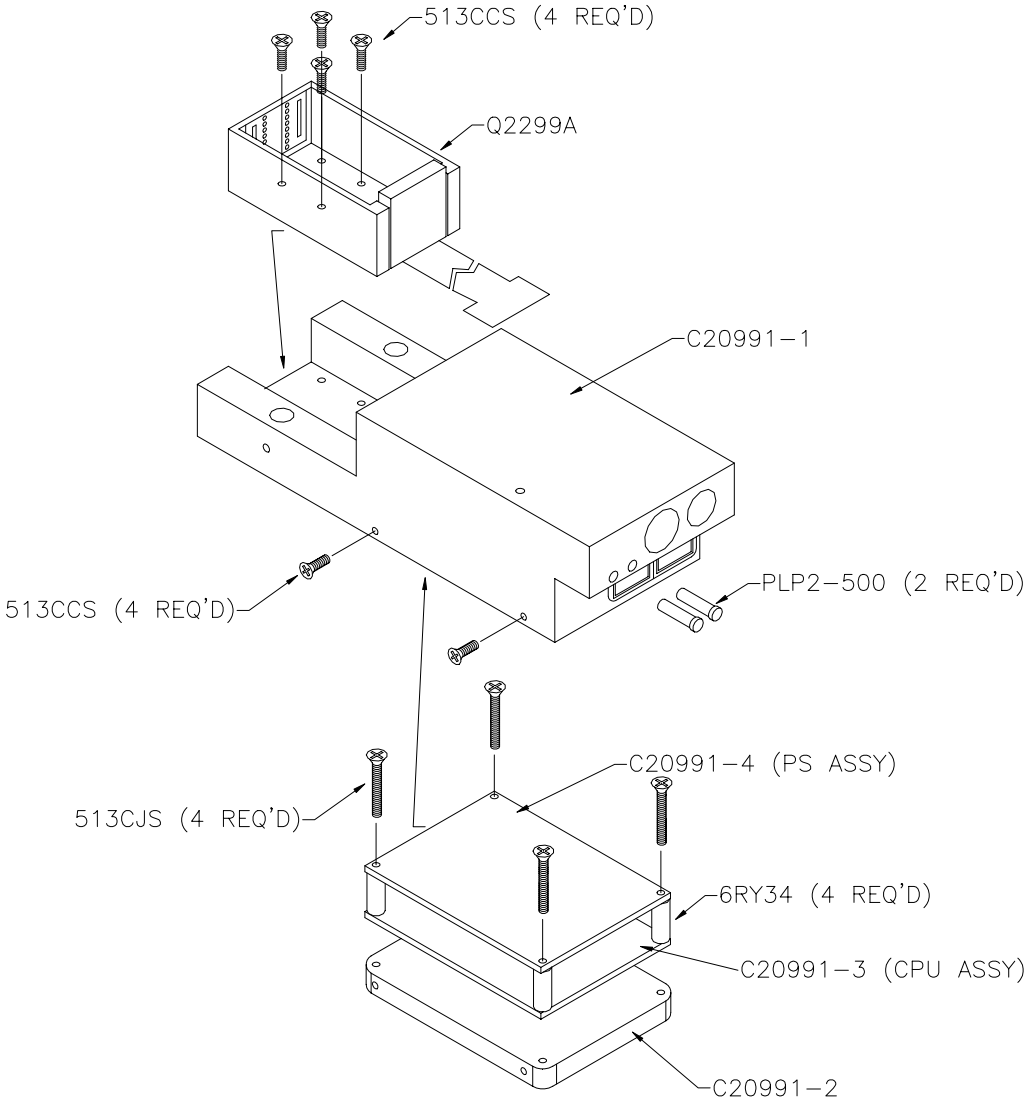
To clean the cartridge, carefully clean the face of the cartridge with a soft, lint free wipe. Use caution in wiping the NOZZLE area so as not to scratch the face. Always wipe in the ARRAY PLATE vertically as indicated.
Clean the CONTACT area in a similar fashion.



PRINT CARRIAGE MAINTENANCE

It is necessary to maintain the print head carriage free from accumulated dust and debris. Periodically the print head carriage should be inspected and cleaned. This is totally dependent on the operating environment. In extremely dusty environments, this maintenance procedure may be required occasionally but on average every week should be sufficient.
Remove the print cartridge and carefully inspect the print carriage C0991 for dust and debris.
Re-insert the print cartridge and place the unit into the PRINTING mode by pressing .

EXPLODED VIEW OF THE C20991 PRINT CARRIAGE



PART 4: TROUBLESHOOTING AND REPAIRS

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- LCD remains blank 4-2
- Unit does not print, although LCD shows information 4-2
- Low ink indicator on with full ink cartridge 4-2
- Unit does not purge 4-2
- Missing one or more dots from code. 4-2
- Unit loses data while printing 4-2

FAULTS

This chart was created to assist the user in troubleshooting the unit. Find the problem in the first column; apply the remedy(s) suggested in the third column.

Condition	Probable Cause	Remedy
LCD remains blank.	No power.	Ensure the controller is securely connected to the correct port on the print carriage assembly
Unit does not print, although LCD shows information.	No message in unit	Input your message (see pages 2-18).
	Unit in "COMMAND" mode.	Press .
	No ink.	Replace ink cartridge; reset ink volume parameter (press F4 and follow the sequence.
Low ink indicator on with full ink cartridge.	Did not reset ink volume parameter.	Press F4. Continue key entry following menu prompts.
Unit does not purge.	Out of ink.	Replace with full ink cartridge. Reset ink volume parameter (press F4).
	Unit in "PRINTING" mode	Press Stop Print.
	Ink cartridge clogged	Clean Ink Cartridge Nozzle area with lint free wipe
Missing one or more dots from code.	No ink.	Clean or Replace cartridge and purge system (press).
	Long downtime.	Follow daily start-up procedure if your line experienced a long down time.
Unit loses data while printing	Static electricity	Eliminate source of static. Attach ground strap between print head and low impedance earth ground.
	High levels of radio frequency.	Move unit to an alternate location or attach ground strap as above.
	Spikes in electrical line.	Use AC line filter

PART 5: PARTS LIST AND OPTIONS

Part No.	Description
	SPARE PARTS
C21030	Controller
C21001-1	Controller Cabinet
C21030-2	Controller LCD Assembly
C21030-1	Controller PCB Assembly
C30238	Controller Keypad
C20991	EVOLUTION SC Print Head Cabinet Assembly
C20991-3	EVOLUTION SC Print Head CPU PCB Assembly
C20991-4	EVOLUTION SC Print Head Power Supply PCB Assembly
C20991-5	Mounting Bracket Assembly
70335-01	Power supply
	OPTIONS
96280-01	Floor stand
C21003	Top Coding Mounting Bracket
C21006-6	External Product Detect
C21007	External Encoder
C21012	Optional Junction Box
	CABLES
C21008-1	RJ50 Cable 6 INCH
C21008-3	RJ50 Cable 3 Feet
C21008-10	RJ50 Cable 10 Feet
C21008-25	RJ50 Cable 25 Feet
C21008-50	RJ50 Cable 50 Feet
C21008-100	RJ50 Cable 100 Feet
	INKS
4052BK	4 Pack of Black Ink Cartridges (porous)
4052RD	4 Pack of Red Ink Cartridges (porous)
4052GR	4 Pack of Green Ink Cartridges (porous)
4052BL	4 Pack of Blue Ink Cartridges (porous)
4053BK	4 Pack of Black Ink Cartridges (semi/non porous)

PART 6: COMMUNICATIONS PROTOCOL

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- Definitions 6-2
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SOFTWARE PROTOCOL 6-4

ERROR CODES 6-4

LIST OF COMMANDS 6-5

This communication protocol covers all EVOLUTION products. Some commands are not applicable to certain units, and care must be taken in determining what valid commands are for a specific unit. Commands that reference specific units are so noted.

ASCII CHARACTER CHART

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	SOH	STX	ETX	EOT	ENQ	ACK	BEL	BS	HT	LF	VT	FF	CR	SO	SI
1	DLE	DC1	DC2	DC3	DC4	NAK	SYN	ETB	CAN	EM	SUB	ESC	FS	GS	RS	US
2	SP	!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
3	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
4	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
6	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
7	p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	DEL

DESCRIPTION

DATA WORD DEFINITION

Full Duplex
7 Data Bits
1 Even Parity Bit
1 Start Bit
1 Stop Bit

BAUD RATE

115,200 Bits per second

DEFINITIONS

Q= QUERY TO HEAD
R= RESPONSE FROM HEAD
D= DATA UPDATE TO HEAD
X= ACK FROM HEAD
{ }= ASCII CHARACTER OR CHARACTER STRING
| FIELD SEPARATOR
0x21 HEX DATA EQUIVELENT
ADDRESS= TWO ASCII REPRESENTATIONS OF HEX CHARACTERS
`x`|`y` TWO ASCII CHARACTERS REPRESENTING THE UPPER AND LOWER NIBBLE OF A HEXADECIMAL BYTE WHERE X IS THE UPPER NIBBLE AND Y IS THE LOWER NIBBLE
FOR EXAMPLE:
TO SEND A SPEED OF 165 FEET PER MINUTE SEND – ASCII : AND ASCII 5 WHICH WOULD BE 0x3A AND 0x35 HEXADECIMAL
TO SEND A DELAY OF 30 SEND – ASCII 3 AND ASCII 0 WHICH WOULD BE 0x33 AND 0x30 HEXADECIMAL

CABLING

The following part numbers define the cabling and accessories for the EVLINK environment

C20552	RS232C to RS485 converter module
C20551	Cable from PC to RS485 converter module
C21008-25	Cable (25') from EVOLUTION units to RS485 data link
C21008-50	Cable (50') from EVOLUTION units to RS485 data link
C21009	Termination plug for RS485 data link

HARDWARE INTERFACE

The EVOLUTION printing systems can communicate via an RS485 data link. When connecting multiple print carriages via an RS485 link, input and output connectors are provided on the print carriage, which allows the cabling to be daisy chained. NOTE: It is important to remember to set each of the print carriages to a unique address.

PHYSICAL CONNECTIONS RS485 print carriage

Pin # 4	= Receive +
Pin # 5	= Receive -
Pin # 6	= Transmit +
Pin # 7	= Transmit -
Pin # 9	= Ground

Note: At the end of the data link a termination plug is installed to balance the RS485 data link connecting pin 4 to pin 5 and pin 6 to pin 7 with120-ohm.

PROTOCOL FORMAT:

Host request for information;

ESC|Command|SOH|EOT (Single End Host to 1 printer)

Or

ESC|STX|Address|Command|SOH|EOT (Multiple printers)

Host sending new information;

ESC|Command|Data|EOT (Single End Host to 1 printer)

Or

ESC|STX|Address|Command|Data|EOT (Multiple printers)

EVOLUTION PRINTABLE CHARACTER SET

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z 0 1 2 3 4 5 6 7 8 9

Special Symbols:

ASCII Character	Hexadecimal	Prints As
' '	(0x20)	Space
!	(0x21)	Hour Glass
#	(0x23)	#
$	(0x24)	$
&	(0x26)	&
(	(0x28)	(
)	(0x29)	)
*	(0x2a)	*
+	(0x2b)	+
-	(0x2d)	-
.	(0x2e)	Period
=	(0x3d)	=
:	(0x3a)	:
/	(0x2f)	/
"	(0x22)	Cents
%	(0x25)	Solid block
;	(0x3b)	Ň
?	(0x3f)	Ě
@	(0x40)	Ó
{	(0x7b}	Logo 1
|	(0x7c)	Logo 2
}	(0x7d}	Logo 3

SOFTWARE PROTOCOL

In the following pages, all references to characters or digits pertain to the standard ASCII character set. The bar (|) character is used as a field separator and it is not part of the transferred data. When data is shown in hexadecimal, it will consist of the hex number preceded by a 0x, for example (0x1B). Generally, all packets to and from a print station begin with an ESC (0x1B) and terminate with an EOT (0x04).

There are two types of commands:

Downloading information to the print station

Requesting information from the print station.

To distinguish the two types of commands, a SOH (0x01) is placed after the command byte in a request command string. The following illustrates this concept:

To download data to print station

ESC/GROUP ADDRESS/UNITADDRESS/COMMAND/DATA/EOT

To request data from the Print Station

ESC/GROUP ADDRESS/UNITADDRESS/COMMAND/SOH/EOT

ERROR CODES

Commands to a print station, if completed successfully, return a single byte response of an ASCII ACK (0x06). If the command was not successful, a two-byte response of an ASCII NAK (0x15) is returned, followed by an error code.

Below is a list of the returned error codes.

NAK 1	= NOT USED
NAK 2	= Illegal Command Byte
NAK 3	= NOT USED
NAK 4	= NOT USED
NAK 5	= Trying to write a read only register
NAK 6	= Print station buffer full must print before next download to clear buffer.
NAK 7	= NOT USED
NAK 8	= NOT USED
NAK 9	= Barcode verification error

COMMANDS:

'!' 0x21 Software Version (read only) (EV I, EV II, EV SC)

Q. ESC|STX|Address|`!`|SOH|EOT

R. ESC|STX|Address|{PRINTER fffffssss}|CR|EOT

Where:

PRINTER= ASCII string PRINTER for EVOLUTION I
EV2 for EVOLUTION II
EVSC for EVOLUTION SC

fffff = Software and Firmware versions
(eg. 2.02H indicates version 2.02 with Firmware version H)

ssss = Optional Software loaded

Where: (for EV I only)

The first y indicates option pack 1
The second y indicates option pack 2
The third y indicates option pack 1.5
The last y is reserved for future expansion

Where: (for EV II and EV SC)

Both units are standard with all options thus a ++++ will be returned

'#' 0x23 Printer Configuration (Read only) (EV I, EV II, EV SC)

Q. ESC|STX|Address|`#`|SOH|EOT

R. ESC|STX|Address|`#`|`x`|`y`|EOT

Where Byte x Bits 3,2,1,0

Bit 3 = if 1 Cartridge Not Valid
Bit 2 = Not Used
Bits 1,0 = System Type
11 = Evolution 1
10 = Evolution 2
01 = Evolution 3
00 = Evolution Small Character

Where Byte y Bits 3,2,1,0

0000 = no options available
0001 = option1 enabled
0010 = option2 enabled
0100 = option3 enabled

'\' 0x5c Unit Serial Number (Read only 6 digits) (EV I, EV II, EV SC)

Q. ESC|STX|Address|`\`|SOH|EOT

R. ESC|STX|Address|`\`|`serial number`|CR|EOT

'l' 0x6c Special Field Flags (EV II, EV SC AND EVI WITH OP1 AND ABOVE)

Q. ESC|STX|Address|`l`|SOH|EOT
R. ESC|STX|Address|`l`|`x`|`y'|EOT
Where: x defines bits 7,6,5,4
Bit 7 = don't care
Bit 6 = dont care
Bit 5 = 1 = No guard bars
Bit 4 = 1 = Man read added to barcode
Where: y defines bits 3,2,1,0
Bit 3 = 1 = Bar checksum added to barcode
Bit 2 = 0 = Calendar will only change on 1st day of week
Bit 1 = 1 = Day of the week is alpha
Bit 0 = 1 = counting down

D. ESC|STX|Address|`l`|`x`|`y`|EOT
X. ESC|STX|Address|`l`|ACK|EOT

'8' 0x38 Control Flags (EV I, EV II, EV SC)

Q. ESC|STX|Address|`8`|SOH|EOT
R. ESC|STX|Address|`8`|`x`|`y`|EOT
Where: x defines bits 7,6,5,4
Bit 7 1 = Head busy printing message
Bit 6 1 = Print image inverted
Bit 5 1 = Head busy manual cycle
Bit 4 1 = Head busy purging
Where: y defines bits 3,2,1,0
Bit 3 1 = External Encoder
Bit 2 1 = External Product Detect
Bit 1 1 = Direction forward
Bit 0 1 = Enable print mode

D. ESC|STX|Address|`8`|`x`|`y`|EOT
X. ESC|STX|Address|`8`|ACK|EOT
Where: x defines bits 7,6,5,4
Bit 7 Don't Care
Bit 6 1 = Print image inverted
Bit 5 Don't Care
Bit 4 Don't Care
Where: y defines bits 3,2,1,0
Bit 3 1 = External Encoder
Bit 2 1 = External Product Detect
Bit 1 1 = Direction forward
Bit 0 1 = Enable print mode

‘G’ 0x47 Errors (note: error codes must be reset) (EV I, EV II, EV SC)

Q. ESC|STX|Address|`G`|SOH||EOT
R. ESC|STX|Address|`G`|'x`|`y'|EOT

Where: x defines bits 7,6,5,4

Bit 7 = UART Overrun Error
Bit 6 = Communication Overrun Error
Bit 5 = UART Framing Error
Bit 4 = UART Parity Error

Where: y defines bits 3,2,1,0

Bit 3 = Font checksum error loading from card to chip
Bit 2 = Font 1 checksum error in Ram
Bit 1 = Font 0 checksum error in Ram
Bit 0 = Real Time Clock Memory error

TO RESET ERROR CODES

D. ESC|STX|Address|`G`|'x`|`y'|EOT

same bit positions as above
use only as a mask to clear error bits.
i.e. x = 0001 and y = 0001 clears real time clock memory error and UART parity error.

X. ESC|STX|Address|`G`|ACK|EOT

'R' 0x52 Head Status (read only) (EV I, EV II, EV SC)

Q. ESC|STX|Address|`R`|SOH|EOT
R. ESC|STX|Address|`R`|`x`|`y`|EOT

Where: x defines bits 7,6,5,4

Bit 7 = Not Used
Bit 6 = Latched eye active
Bit 5 = Unfiltered eye active
Bit 4 = Product being printed

Where y defines bits 3,2,1,0

Bit 3 = auto repeat print gap active
Bit 2 = Not Used
Bit 1 = Input buffer Line 2 full
Bit 0 = Input buffer Line 1 full

'B' 0x42 Set Unit Address (Write Only) (EV I, EV II, EV SC)

D. ESC|STX|Address|`B`|`x`|`y`|EOT
X. ESC|STX|Address|`B`|ACK|EOT

Where x y = 8 bit unit address
i.e. x = 0x31 & y = 0x35 yields unit address 15

'1' 0x31 Auto Repeat Inter-print delay (Range 0 - 255) (EV II, EV SC AND EVI with any option pack)

Q. ESC|STX|Address|`1`|SOH|EOT
R. ESC|STX|Address|`1`|`x`|`y`|EOT

D. ESC|STX|Address|`1`|`x`|`y`|EOT
X. ESC|STX|Address|`1`|ACK|EOT
0 = Auto Repeat Disabled
Each count provides a delay equal to 16 columns for EV I and EV II.
Each count provides a delay equal to 2 columns for EV SC.

'&' 0x26 Line Speed (RANGE 10-200) (EV I, EV II, EV SC)

Q. ESC|STX|Address|`&`|SOH|EOT
R. ESC|STX|Address|`&`|`x`|`y`|EOT

D. ESC|STX|Address|`&`|`x`|`y`|EOT
X. ESC|STX|Address|`&`|ACK|EOT

'd' 0x64 Encoder Divider (Range 0-7) (EV I, EV II, EV SC)

Q. ESC|STX|Address|`d`|SOH|EOT
R. ESC|STX|Address|`d`|`x`|`y`|EOT

D. ESC|STX|Address|`d`|`x`|`y`|EOT
X. ESC|STX|Address|`d`|ACK|EOT

'"' 0x27 Product Delay (RANGE 1-255) (EV I, EV II, EV SC)

Q. ESC|STX|Address|`0x27`|SOH|EOT
R. ESC|STX|Address|`0x27`|`x`|`y`|EOT

D. ESC|STX|Address|`0x27`|`x`|`y'|EOT
X. ESC|STX|Address|`0x27`|ACK|EOT

')' 0x29 Inter-Character spaces (RANGE 1-25) (EV I, EV II, EV SC)

Q. ESC|STX|Address|`)`|SOH|EOT
R. ESC|STX|Address|`)`|`x`|`y`|EOT

D. ESC|STX|Address|`)`|`x`|`y'|EOT
X. ESC|STX|Address|`)`|ACK|EOT

'>' 0x3E Head Align (Range 0 - 16) 'O' on keyboard (EV II only)

Q. ESC|STX|Address|`>`|SOH|EOT
R. ESC|STX|Address|`>`|`x`|`y'|EOT

D. ESC|STX|Address|`>`|`x`|`y`|EOT
X. ESC|STX|Address|`>`|ACK|EOT

'4' 0x34 Sequence Number Rollover Value (EV II, EV SC AND EV1 with version 2.09 and OP2 or 3)

Q. ESC|STX|Address|`4`|SOH|EOT
R. ESC|STX|Address|`4`|{##########}|CR|EOT
where ########## = rollover value in ascii

D. ESC|STX|Address|`4`|{##########}|CR|EOT
X. ESC|STX|Address|`4`|ACK|EOT

'[' 0x5b DATE_ROLLOVER (EV II, EV CS AND EV1 with version 2.09 and OP2 or 3)

Q. ESC|STX|Address|`[`|SOH|EOT
R. ESC|STX|Address|`[`|`x`|`y`|`x1`|`y1`|EOT
Where:
|`x`|`y`| = Time of Day Hours
|`x1`|`y1`| = Time of Day Minutes

D. ESC|STX|Address|`[`|`x`|`y`|`x1`|`y1`|EOT
X. ESC|STX|Address|`[`|ACK|EOT

'3' 0X31 Days until Expiration (max 999) (EV II, EV SC AND EVI WITH OP3)

Q. ESC|STX|Address|`3`|SOH|EOT
R. ESC|STX|Address|`3`|`aaaa`|EOT
Where: each set of 2 ASCII characters represent the upper and lower nibble of a packed BCD byte

D. ESC|STX|Address|`3`|aaaa`|EOT
Where: each set of 2 ASCII characters represent the upper and lower nibble of a packed BCD byte
X. ESC|STX|Address|`3`|ACK|EOT

'r' 0x52 Remaining Ink (0 to 99%) (EV I, EV II, EV SC)

Q. ESC|STX|Address|`R` |SOH|EOT
R. ESC|STX|Address|`R`|`x`|`y`|EOT

‘0’ 0x30 Shift Code (max 6 shift codes) (EV II, EV SC AND EVI WITH OP3)

Q. ESC|STX|Address|`0`|SOH||EOT

R. ESC|STX|Address|`0`|`hh mm`|{zz}|……|CR|EOT

Where: each set of 2 ASCII characters represent the upper and lower nibble of a packed BCD byte

…… = pattern repeat for each shift code programmed

hh = shift start hours

mm = shift start minutes

zz = shift code to print

D. ESC|STX|Address|`0`|`hhmm`|{z}|CR|EOT

Where: each set of 2 ASCII characters represent the upper and lower nibble of a packed BCD byte

hh = shift start hours

mm = shift start minutes

zz = shift code to print

X. ESC|STX|Address|`0`|ACK|EOT

‘/’ 0x2f Product Counter (6 Digits Max) (EV II, EV SC AND EVI WITH OP3)

Q. ESC|STX|Address|`/`|SOH|EOT

R. ESC|STX|Address|`/`|`HH MM hh mm`|{cccccc}|CR|EOT

Where: each set of 2 ASCII characters represent the upper and lower nibble of a packed BCD byte

HH = Product counter start hours

MM = Product counter start minutes

hh = Product counter stop hours

mm = Product counter stop minutes

cccccc = counter (6 Digits Max)

D. ESC|STX|Address|`/`|`ww xx yy zz`|{cccccc}|CR|EOT

Where: each set of 2 ASCII characters represent the upper and lower nibble of a packed BCD byte

HH = Product counter start hours

MM = Product counter start minutes

hh = Product counter stop hours

mm = Product counter stop minutes

cccccc = counter

X. ESC|STX|Address|`/`|ACK|EOT

SPECIAL FIELD OBJECTS

Message Objects define special characteristics about the messages contained in line 1 or line 2. These may define for example font size, sequence number, date code, etc. There may be up to 15 Objects (special fields) for each line in a message with the limitation that there can only be 1 sequence number imbedded in a message.

'P' 0x50 Message Objects (EV I, EV II, EV SC)

Q. ESC|STX|Address|`P`|SOH|aabb|EOT

R. ESC|STX|Address|`P`|'aa bb cc dd ee ff gggg hhhh'|EOT

Where: each set of 2 ASCII characters represent the upper and lower nibble of a byte

aa = objects for which line 0 or 1

bb = number of objects transmitted. (Max 15)

Each object as defined by bb: (repeat the for each object)

cc = Position within message string

dd = Number of characters in object

ee = Attribute of the object

Where:

ee= 00 Normal Alpha/Numeric character
ee= 01 Time Hours
ee= 02 Time Minutes
ee= 03 Time Seconds
ee= 04 Date Month
ee= 05 Date Day
ee= 06 Date Year
ee= 07 Date Julian
ee= 08 Sequence Number (1 per message)
ee= 09 Barcode
ee= 0A Shift Code
ee= 0B Expiration Date Month
ee= 0C Alpha Date Code
ee= 0D Expiration Date Year
ee= 0E Expiration Date Julian
ee= 0F Expiration Date Day
ee= 10 Day of Week (1-7)
ee= 80 Bar Code Attribute (EV II only)

'P' 0x50 Message Objects (continued)

ff = font of object

Where: for EV I AND EV II

ff= 00 for 2 Line Font
ff= 01 for 1 Line Font
ff= 02 for 3 Line Font (EV II only)
ff= 03 for 4 Line Font (EV II only)

Where: for EVSC ONLY

ff= 00 for S5 Font
ff= 01 for S7 Font
ff= 02 for B7 Font
ff= 03 for S12 Font
ff= 04 for B12 Font

gggg = starting column of object in printed image (reserved)
hhhh = starting row of object in printed image (reserved)

D. ESC|STX|Address|`P`|`aa bb cc dd ee ff gggg hhhh`|EOT
X. ESC|STX|Address|`P`|ACK|EOT

NOTE: TO ENTER A LOGO CALLOUT INTO A MESSAGE USE THE ACSII CHARACTERS 0x7B FOR LOGO1 0x7C FOR LOGO 2 AND 0x7D FOR LOGO 3

'$' 0x24 Line 1 Message
(EV I max 24 characters – 48 characters OP1.5, 2 or 3)
(EV II max 48 characters)
(EV SC max 96 characters)

Q. ESC|STX|Address|`$`|SOH|EOT
R. ESC|STX|Address|`$`|{message}|CR|EOT

D. ESC|STX|Address|`$`|{message}|CR|EOT
X. ESC|STX|Address|`$`|ACK|EOT

'%' 0x25 Line 2 Message
(EV I max 24 characters – 48 characters OP1.5, 2 or 3)
(EV II max 48 characters)
(EV SC max 96 characters)

Q. ESC|STX|Address|`%`|SOH|EOT
R. ESC|STX|Address|`%`|{message}|CR|EOT

D. ESC|STX|Address|`%`|{message}|CR|EOT
X. ESC|STX|Address|`%`|ACK|EOT

'w' 0x77 Line 3 Message (max 24 characters)
(EV II only max 48 characters)

Q. ESC|STX|Address|`$`|SOH|EOT
R. ESC|STX|Address|`$`|{message}|CR|EOT

D. ESC|STX|Address|`$`|{message}|CR|EOT
X. ESC|STX|Address|`$`|ACK|EOT

'z' 0x7a Line 4 Message (max 24 characters)
(EV II only max 48 characters)

Q. ESC|STX|Address|`$`|SOH|EOT
R. ESC|STX|Address|`$`|{message}|CR|EOT

D. ESC|STX|Address|`$`|{message}|CR|EOT
X. ESC|STX|Address|`$`|ACK|EOT

':' 0x3A Logo1 Name (read only - max 9 characters)
(EV I, EV II)

Q. ESC|STX|Address|`:`|SOH|`x`|`y`|EOT
R. ESC|STX|Address|`:`|{logo name}|CR|EOT
Where: x = don't care
y = Bit 0 = 0 = Logo Name in Font 0
1 = Logo Name in Font 1
Bit 1 = 0 = Get Name from on board data flash chip
1 = Get Name fro Data Flash card

';' 0x3B Logo2 Name (read only - max 9 characters)
(EV I, EV II)

Q. ESC|STX|Address|`;`|SOH|`x`|`y`|EOT
R. ESC|STX|Address|`;`|{logo name}|CR|EOT
Where: x = don't care
y = Bit 0 = 0 = Logo Name in Font 0
1 = Logo Name in Font 1
Bit 1 = 0 = Get Name from on board data flash chip
1 = Get Name fro Data Flash card

'<' 0x3C Logo3 Name (read only - max 9 characters)
(EV I, EV II)

Q. ESC|STX|Address|`<`|SOH|`x`|`y`|EOT
R. ESC|STX|Address|`<`|{logo name}|CR|EOT
Where: x = don't care
y = Bit 0 = 0 = Logo Name in Font 0
1 = Logo Name in Font 1
Bit 1 = 0 = Get Name from on board data flash chip
1 = Get Name fro Data Flash card

'Q' 0x51 Starting Sequence Number (max. length 9 digits) (EV II, EV SC AND EV1 with version 2.09 and after)

Q. ESC|STX|Address|`Q`|SOH|EOT
R. ESC|STX|Address|`Q`|{zzzzzzzzz}|CR|EOT

Where:

zzzzzzzzz = ASCII string which is the starting sequence number to print.

D. ESC|STX|Address|`Q`|{zzzzzzzzz}|CR|EOT
X. ESC|STX|Address|`Q`|ACK|EOT

'2' 0x32 Date and Time Setting / Reading (EV I, EV II, EV SC)

Q. ESC|STX|Address|`2`|SOH|EOT
R. ESC|STX|Address|`2`|`aa bb cc dd ee ff gg'|EOT

Where: each set of 2 ASCII characters represent the upper and lower nibble of a packed BCD byte
aa= Time of Day Seconds (not used)
bb= Time of Day Minutes
cc= Time of Day Hours
dd= Day of Week
ee= Date Day
ff = Date Month
gg= Date Year

D. ESC|STX|Address|`2`|`aa bb cc dd ee ff gg'|CR|EOT
X. ESC|STX|Address|`2`|ACK|EOT

'u' 0x75 Store message in non-volatile memory (Write only) (EV I, EV II, and EV SC)

D. ESC|STX|Address|`u`| EOT
X. ESC|STX|Address|`u`|ACK|EOT

NOTE: THE FOLLOWING CODES ARE SPECIFIC TO EVOLUTION II ONLY

' " ' 0x22 Minimum Bar Width (Range 3-15 Data matrix 2-15) Default 5

Q. ESC|STX|Address|`"`|SOH|EOT
R. ESC|STX|Address|`"`|`x`|`y`|EOT

D. ESC|STX|Address|`"`|`x`|`y`|EOT
X. ESC|STX|Address|`"`|ACK|EOT

' .' 0x2e Bleed Compensation (Range 0 - 3) Default 0

Q. ESC|STX|Address|`.`|SOH|EOT
R. ESC|STX|Address|`.`|`x`|`y`|EOT

D. ESC|STX|Address|`.`|`x`|`y`|EOT
X. ESC|STX|Address|`.`|ACK|EOT

' * ' 0x28 Quiet Zone (Range 0 - 150) Default 75

Q. ESC|STX|Address|`*`|SOH|EOT
R. ESC|STX|Address|`*`|`x`|`y`|EOT

D. ESC|STX|Address|`*`|`x`|`y`|EOT
X. ESC|STX|Address|`*`|ACK|EOT

'n' 0x6e Type of Barcode (read only)

Q. ESC|STX|Address|`n`|SOH|EOT
R. ESC|STX|Address|`n`|`x`|`y`|EOT

where

x = number of available barcodes
y = type of barcode

0= CODE39
1= TWO OF FIVE
2= CODE 128B
3= CODE 128C
4= UPCA
5= UPCE
6= EAN8
7= EAN13
8= DATAMATRIX

'?' 0x3F Barcode Name(read only)

Q. ESC|STX|Address|`?`|SOH|`x`|`y`|`x1`|`y1`|EOT

Where:

`x``y` = Barcode type as in 'n' command

`x1`|`y1` = don't care

R. ESC|STX|Address|`?`|{BARCODENAME}|CR|EOT

where BARCODENAME = Ascii name of type of barcode

'=' 0x3d Barcode Verify

D. ESC|STX|Address|`=`|`x`|`y`|{BARCODESTRING}|CR|EOT

x = don't care

y = type of barcode (same as 'n' command)

BARCODESTRING = Barcode Ascii data

X. ESC|STX|Address|`=`|`xy`|EOT

where

if barcode verifies

ESC|STX|Address|`=`|ACK|EOT

if barcode doesn't verify

ESC|STX|Address|`=`|NAK|{9}|EOT

Example written in C to query a print station to determine the line speed.

```
// Query Print Station Address 7 for Line Speed
        putchar(0x1b);          // Send out ESC
        putchar(0x02);          // Send out STX
        putchar(0x30);          // Send out upper nibble of address 07
        putchar(0x37);          // Send out lower nibble of address 07
        putchar(0x26);          // Send out a '&' command
        putchar(0x01);          // Send out SOH
        putchar(0x04);          // Send out EOT

        // Get results from print station
        {
        unsigned char dummy,speed;

                dummy = getchar();                      // Get ESC
                dummy = getchar();                      // Get STX
                dummy = getchar() << 4;                 // Get upper nibble of address
                dummy |= getchar() & 0x0f;              // Get lower nibble of address
                if(dummy == our_address)
                {
                        dummy = getchar();              // Get command
                        speed = getchar() << 4;         // Get upper nibble of speed
                        speed |= getchar() & 0x0f;      // Get lower nibble of speed
                        dummy = getchar();              // Get EOT
                } else {
                        // error handler (not our address)
                }
        }
```

Example written in C to send a line speed to a print station

```
// Send Print Head Address 2 Line Speed of 100 feet per minute.
        putchar(0x1b);          // Send out ESC
        putchar(0x02);          // Send out STX
        putchar(0x30);          // Send out upper nibble of address
        putchar(0x32);          // Send out lower nibble of address
        putchar(0x26);          // Send out '&' command
        putchar(0x36);          // Send out upper nibble for Line Speed 100
        putchar(0x34);          // Send out lower nibble for Line Speed 100
        putchar(0x04);          // Send out EOT

        // Get results from print station
        {
        unsigned char dummy;

                dummy = getchar();                      // Get ESC
                dummy = getchar();                      // Get STX
                dummy = getchar() << 4;                 // Get upper nibble of address
                dummy |= getchar() & 0x0f;              // Get lower nibble of address
                if(dummy == our_address)
                {
                        dummy = getchar();              // Get command
                        dummy = getchar();              // Get ACK for print station
                        if(!dummy == ACK)
                        {
                                // error handler (didn't get acknowledgement from printer)
                        } else {
                                dummy = getchar();      // Get EOT
                        }
                } else {
                        // error handler (not our address)
                }
        }
```

Example written in VB to send a new message to a print station.

```
Public Sub DoMessage()
DATA$ = "800": GETINFODATA: Rem DISABLE PRINT MODE
DATA$ = "&32": GETINFODATA: Rem SET LINE SPEED TO 50
DATA$ = "P01010010000100000000" & Chr$(&HD): GETINFODATA: Rem SET OBJECTs
DATA$ = "%ABCDEFGHIJ" & Chr$(&HD): GETINFODATA: Rem SEND MESSAGE
End Sub

Public Sub GETINFODATA() : :  Rem SENDS A COMMAND AND GETS A RESPONSE
RESPONSE$ = "": COMM.InBufferCount = 0
COMM.Output = ESC & STX & "01" & DATA$ & EOT
Timer.Enabled = True: TIMERFLAG = False
GETINFO:
   Do
      DoEvents
      If TIMERFLAG = True Then GoTo TCOMMERROR
   Loop Until COMM.InBufferCount >= 1
      RESPONSE$ = RESPONSE$ & COMM.Input
      If InStr(RESPONSE$, Chr$(&H15)) > 0 Then GoTo GETDATAERROR:
Rem A NAK WAS RECEIVED
      If InStr(RESPONSE$, Chr$(&H4)) = 0 Then GoTo GETINFO
Rem AN EOT WAS RECEIVED
      RESPONSE$ = Mid$(RESPONSE$, 6, Len(RESPONSE$))
Rem DELETE ADDRESS HEADER
      Timer.Enabled = False
Rem WE NOW HAVE A VALID RESPONSE
      Exit Sub
GETDATAERROR:
   Timer.Enabled = False: TIMERFLAG = False
   GoTo PROCESSERROR
   Exit Sub
TCOMMERROR:
   Timer.Enabled = False: TIMERFLAG = False
PROCESSERROR:
If RESPONSE$ = "" Then RESPONSE$ = "0" Else RESPONSE$ = Right$(RESPONSE$, 1):
Rem GET THE ERROR CODE
Select Case (RESPONSE$)
   Case 0
      MSG$ = "NO RESPONSE FROM UNIT"
   Case 1
      MSG$ = "TRANSMISSION ERROR"
   Case 2
      MSG$ = "ILLEGAL COMMAND"
   Case 3
      MSG$ = "TRYING TO PRINT WHILE IN COMMAND MODE"
   Case 4
      MSG$ = "TRYING TO READ A WRITE ONLY REGISTER"
   Case 5
      MSG$ = "TRYING TO WRITE A READ ONLY REGISTER"
   Case 6
      MSG$ = "UNIT INPUT BUFFER FULL"
   Case 7
      MSG$ = "UNIT IN EDIT MODE"
   Case 8
      MSG$ = "PRINT STATION BUSY TRY AGAIN"
   End Select
```

```
    MsgBox MSG$
    COMM.InBufferCount = 0: Rem FLUSH THE INPUT BUFFER
End Sub
```

THE ABOVE VB ROUTINES DEMONSTRATE THE ENTIRE SEQUENCE OF:

PREPARING DATA TO SEND TO THE HEAD
SENDING THE DATA TO THE HEAD
WAIT FOR A RESPONSE
DETERMINE IF THE DATA WAS ACCEPTED OR REJECTED

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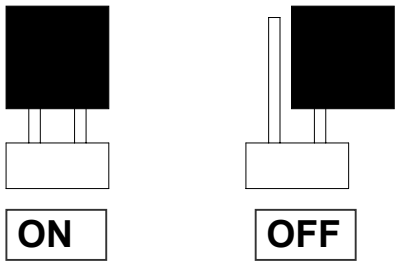
OPTION JUMPER DESCRIPTIONS

Factory default for all jumper settings is in the ON position. To remove a jumper in the OFF position place the jumper on a single pin for future use



VSEL J4

This jumper when in the ON position supplies a +12vdc source on the RJ50 input connector. The hand held controller uses this source for power. Removing this jumper prevents the +12vdc source from exiting on pin 2 and possibly damaging other external control devices.

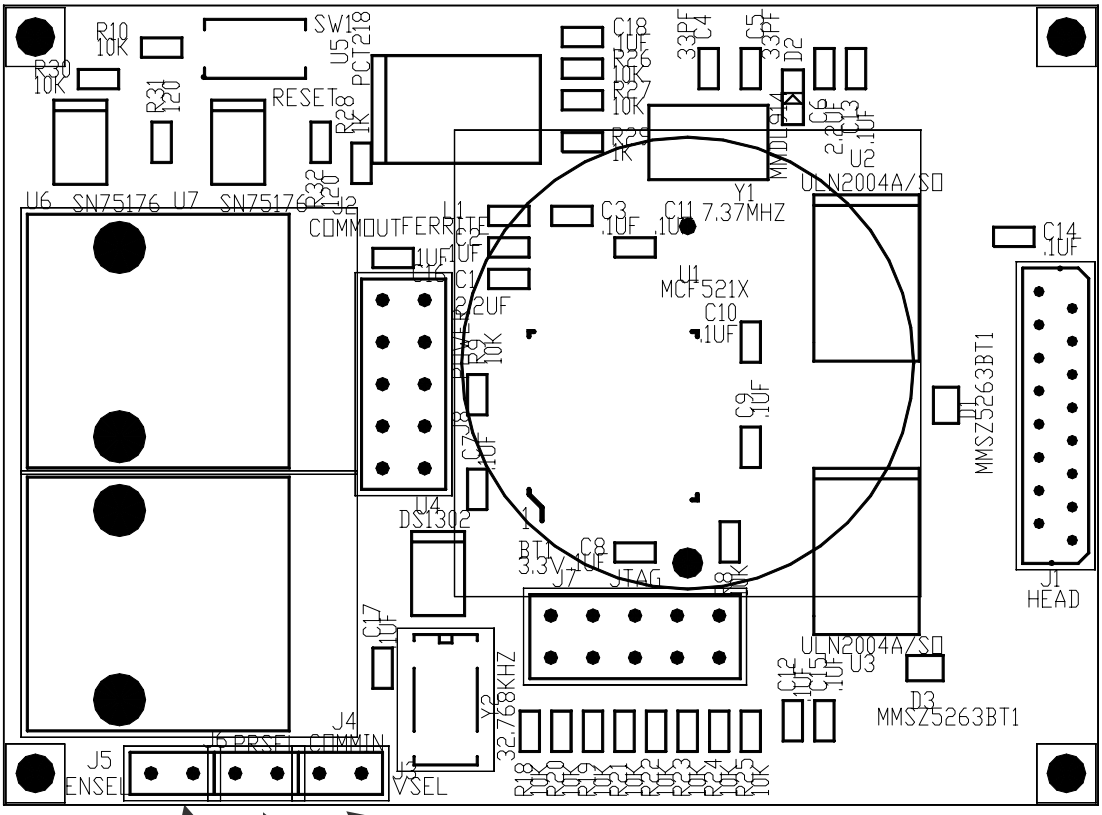
ENSEL J5

When this jumper is in the ON position the external encoder signal connected to the RJ50 output connector is passed through the print carriage to the RJ50 input connector. This allows the same encoder signal to drive several print carriages. If this is not desired remove the jumper

PRSEL J6

When this jumper is in the ON position the external product detect signal connected to the RJ50 output connector is passed through the print carriage to the RJ50 input connector. This allows the same product detect signal to drive several print carriages. If this is not desired remove the jumper

JUMPER LOCATION



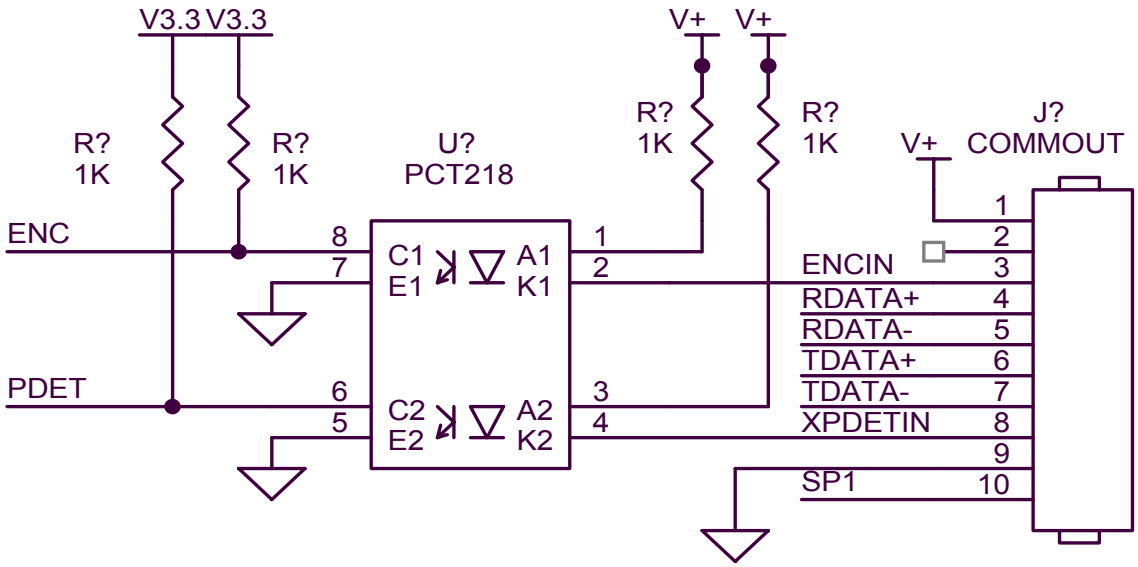
VOLTAGE SELECT
VSEL J4
ON= +12 OUTPUT
OFF= FLOAT OUTPUT

EXTERNAL PRODUCT
DETECT
PRSEL J6
ON=PASS THRU
OFF=FLOAT OUTPUT

EXTERNAL ENCODER
ENSEL J5
ON= PASS THRU
OFF= FLOAT OUTPUT

OPTION CABLING DESCRIPTIONS

Evolution printers can accept inputs from external sources to control product detection and timing circuits to track product speed (Encoders). These device inputs are internally connected to pull-up resistors and drive optically isolated devices and may be driven by open collector or switch contacts.



Each input requires the capability of sinking 12ma to ground as depicted in the above circuit. Connection to the optional control port requires an RJ50 connector.

Below is an example of the external product detect eye supplied by DIGITAL DESIGN INC part number C21006.

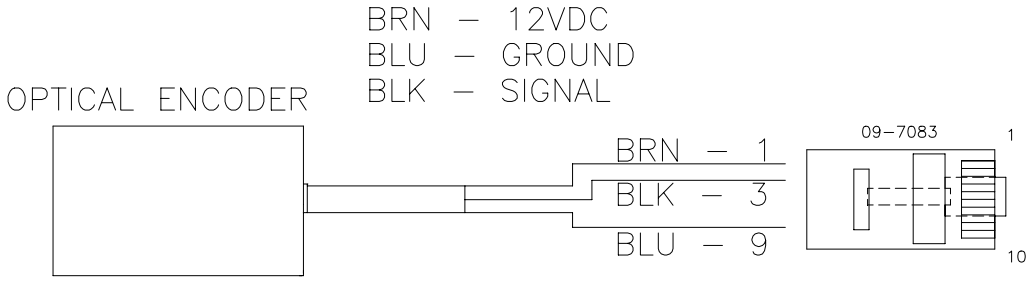
For those applications requiring accurate line speed detection an external encoder is needed.

The external encoder will provide accurate signals eliminating problems in those applications where moving product has an acceleration or deceleration component in its motion. Selecting the external encoder should take into consideration a supply source that will yield the correct aspect ration of printed height to width.

A vertical printed column contains 12 dots and spans 1/8”. This equates to 0.0104 between each vertical dot placement, thusly each horizontal dot placement should be the same to maintain a perfect 96 DPI ratio.

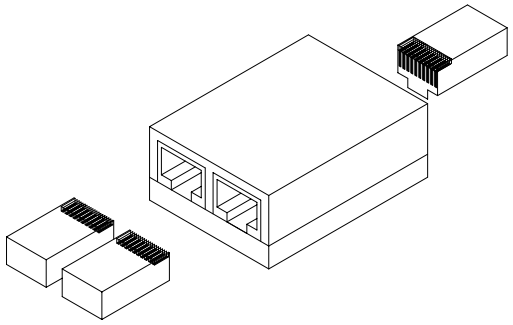
Selecting the external encoder, the line speed calculation is replaced by a scalable encoder setting ranging from 0-7 allowing a printed message to be compressed or expanded. Ideally, the external encoder should be provided to use this feature to its maximum advantage.

If the external encoder were selected to provide a resolution of 0.0104 then the external encoder set to 0 would produce the correct aspect ratio and the message can only be expanded in multiples of 0.0104 thousands of an inch. This may provide all that is required. Selecting an external encoder source that provided 0.005 thousands of an inch would be a better choice.



The above pictorial is an example of the connections for an external encoder.

If it becomes necessary to supply both external product detect, and external encoder, both signals can be wired into the same connector, or DIGITAL DESIGN INC can supply an optional adaptor to allow connection of both cables (part number C21012)



PART 8: SPECIFICATIONS

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PRINTER SPECIFICATIONS

PRINT CHARACTERISTICS

Character Set:	Full alphanumeric and 20 special symbols
Standard Font:	DDI Dot Matrix style
Line Speeds:	From 10 to 200 fpm
Encoder Ratio:	0 to 7
Print Delay:	From 1 to 255 (approx .060 in to 15.0 in)
Character Heights:	
	1/8" single line of print (12X9 and 12X9 BOLD)
	3/32" single line of print (7x5 and 7x5 BOLD)
	1/16" two lines of print (5x5)
Length:	96 characters (1 OR 2 LINES)
Message Storage	100 Messages
Print Head to Product Distance:	Up to 3/8" (9.5 mm)

CONTROLLER

Standard Finish:	Hi Impact ABS Black
Dimensions:	5.6"H x 2.1"W x 1.45"D (142 mm x 53 mm x 36. mm)
Weight:	1 lbs. (4.5 kg)
Control Panel:	Touch Switches and Graphic (WSYWIG) Line LCD

PRINT CARRIAGE

Standard Finish:	Aluminum Black Anodized
Dimensions:	1.45"H x 2.1"W x 5.6"D (37 mm x 53 mm x 142 mm)
Weight:	1 lbs. (4.5 kg)

ENVIRONMENTAL CONDITIONS

Temperature Range:	40°F - 104°F (5°C - 40°C)
Humidity:	up to 90% relative, non-condensing
Electrical Supply:	100-250 VAC; 50-60 Hz; 0.25Amp

GENERAL

Product Detector:	Remote IR LED convergent
Communications link	RS485 (115KBAUD 7-BITS EVEN PARITY 1 STOP BIT)

DEFAULT SETTINGS

FUNCTION	DEFAULT SETTING	RANGE
DIRECTION	◀	◀ ▶
FONTS	DOT MATRIX	USER DEFINED
INTER-CHARACTER SPACING	0	1 - 25
LANGUAGE	ENGLISH	ENGLISH / SPANISH
LINE SPEED	100	10 - 200
PRINT INVERSE	NORMAL	NORMAL / INVERSE
PRODUCT DETECT	EXTERNAL ONLY	
EXTERNAL ENCODER	INTERNAL	INTERNAL / EXTERNAL
PRINT DELAY	1	1 - 255
ENCODER RATIO	4	1 - 7
MESSAGE STORAGE	1	1 - 100
PASSWORD	12345	5 CHARACTERS USER DEFINED
AUTO REPEAT	0	0 - 255
DATE	dd/dm/dy	User defined
TIME	hh:mm	User defined